

# Open Research Online

---

The Open University's repository of research publications and other research outputs

## Energy Utopianism and the rise of the anti-nuclear power movement in the UK

### Thesis

#### How to cite:

Herring, Horace (2003). Energy Utopianism and the rise of the anti-nuclear power movement in the UK. PhD thesis The Open University.

For guidance on citations see [FAQs](#).

© 2003 The Author



<https://creativecommons.org/licenses/by-nc-nd/4.0/>

Version: Version of Record

Link(s) to article on publisher's website:  
<http://dx.doi.org/doi:10.21954/ou.ro.0000e819>

---

Copyright and Moral Rights for the articles on this site are retained by the individual authors and/or other copyright owners. For more information on Open Research Online's data [policy](#) on reuse of materials please consult the policies page.

---

[oro.open.ac.uk](http://oro.open.ac.uk)

# Energy Utopianism and the rise of the anti-nuclear power movement in the UK

Horace Herring B.Sc.

A Thesis Submitted  
for the degree of Doctor of Philosophy

October 2003

Author No: 17202932  
Submission date: 28 March 2003  
Award date: 10 November 2003

## Abstract

### **Energy Utopianism and the rise of the anti-nuclear power movement in the UK**

This thesis is about the growth of the anti nuclear power movement in the UK from 1955 to 1979. It seeks to explore why it emerged at the time and in the form it did. It challenges some of the existing histories and provides new explanations as to how and why, and indeed when the anti-nuclear movement emerged. It is not a policy history, but a history of activism based on accounts collected from the contemporary literature and from the activists.

Its hypothesis is that an anti-nuclear power movement emerged in UK in the 1970s because of long standing concerns of a minority over the dangers of 'atomic energy' and the continuity of opposition to the building of nuclear power stations. The divisions within the nuclear establishment over reactor choice in UK (and radiation and safety standards in US) gave new radical groups- the environmentalists - an opportunity to build a movement using new tactics of protest.

The first part gives a historical account of early criticism, late 1950s protest at public inquiries, and campaigns over nuclear power from 1965 to 1979, and is based on literature surveys, interviews with anti-nuclear campaigners and research on archive material. The second part, mainly theoretical, identifies and discusses what I consider the key concepts of 'the environmental impulse', 'nuclear fear' and 'energy utopianism'. The thesis illustrates the diversity and continuity of anti-nuclear protestors, and is used to make some generalisations about their motivations and tactics, and the likelihood of future protests over new energy technologies.

<b>Contents</b>	<b>Page</b>
Abstract	2
Table of Contents	4-6
Acknowledgements	7
List of Tables and Figures	8
Acronyms and Abbreviations	9



## Table of Contents

<b>1.</b>	<b>Introduction: a search for the roots of the UK anti-nuclear power movement.</b>	<b>10</b>
1.1	Old nuclear explanations	10
1.2	Structure of thesis	11
1.2.1	Part 1: Anti-nuclear activism	11
1.2.2	Part 2: Ideas and explanations	12
1.3	Methodology	13
1.3.1	Environmental History	14
1.3.2	The purpose of environmental history	14
1.3.3	Activist literature	15
1.3.4	Insider accounts	16
<b>2.</b>	<b>Nuclear criticism and protest 1955: 1970</b>	<b>18</b>
2.1	Early Specialist criticism	18
2.1.1	Stretch Critique	19
2.1.2	1960s Fuel policy	20
2.2	The 1950s Public Inquiries	22
2.2.1	Bradwell	23
2.2.2	Hunterston	24
2.2.3	Trawsfynydd.	25
2.2.4	Dungeness	26
2.3	The NUM anti-nuclear campaign in the 1960s	27
2.3.1	The Hartlepool Crisis	28
2.4	Stourport	31
2.4.1	National Press coverage	32
2.4.2	Local Opposition	33
2.4.3	CEGB arrogance	34
2.4.4	Opposition mounts	35
2.4.5	County Council report	36
2.4.6	Stourport: the end.	40
2.5	Portskewett	41
<b>3.</b>	<b>The building of the UK anti-nuclear power movement in the 1970s</b>	<b>43</b>
3.1	Nuclear power in the eco-press	43
3.2	ConSoc debate and early action	45
3.2.1	ConSoc Nuclear Policy	46
3.2.2	Anti-nuclear campaign	48
3.2.3	Downing Street march	49
3.3	Early FoE Attitudes	50
3.3.1	Lack of campaign	51
3.3.2	Development of a campaign	52
3.4	Early Local Campaigns	53
3.4.1	Half-Life	53
3.4.2	Network for Nuclear Concern	56
3.4.3	SCRAM	57
3.4.4	Survival	58
3.4.5	Nuclear Reactor Vigilantes	59
3.5	Network of Groups	59
3.5.1	Nuclear Information Network	60
3.5.2	CANTO	61

3.5.3	People for a Non-nuclear world	62
3.5.4	PERG	62
3.5.5	Society for Environmental Improvement	62
3.5.6	SERA and the Left	63
3.5.7	Energy 2000	64
<b>4.</b>	<b>The Windscale Inquiry: glory or fiasco?</b>	<b>66</b>
<b>4.1</b>	<b>The Great Energy Debate</b>	<b>66</b>
4.1.1	The Windscale Rally	67
4.1.2	CANTO demo	70
4.1.3	The National Energy Conference	71
<b>4.2</b>	<b>Windscale Appeal</b>	<b>72</b>
<b>4.3</b>	<b>Windscale aftermath</b>	<b>75</b>
4.3.1	Reaction to the Parker Report	76
4.3.2	FoE Demo	80
4.3.3	Call for direct action	81
<b>5.</b>	<b>The Environmental Universe: Boundaries and Explanations</b>	<b>85</b>
5.1.1	What is an 'environmentalist'?	85
<b>5.2</b>	<b>The Environmental Impulse</b>	<b>86</b>
5.2.1	Value based	87
5.2.2	Attitudes to nature	88
5.2.3	Triggers	90
<b>5.3</b>	<b>Social movements and intellectuals</b>	<b>91</b>
5.3.1	Social movements	92
5.3.2	Movement intellectuals	93
5.3.3	Why an activist?	95
5.3.4	FoE Groups	95
5.3.5	Women Activists	96
<b>5.4</b>	<b>The environmental movement</b>	<b>98</b>
5.4.1	Group formation	99
5.4.2	The new environmental movement	101
5.4.3	Pre-FoE Eco-Action	103
5.4.4	FoE UK formation	104
5.4.5	FoE's bottle dump: gesture as theatre.	106
5.4.6	Early anti-nuclear activism	107
<b>6.</b>	<b>Anti-nuclear explanation: from image to action</b>	<b>109</b>
<b>6.1</b>	<b>SF visions</b>	<b>109</b>
6.1.1	Atomic power	111
<b>6.2</b>	<b>Public opinion</b>	<b>112</b>
6.2.1	Anxieties over radiation	113
<b>6.3</b>	<b>Weart's 'Nuclear fear'</b>	<b>115</b>
6.3.1	The WHO Study Group	116
6.3.2	Linking bombs and nukes	117
6.3.3	Mastery of Nature	117
<b>6.4</b>	<b>Why anti-nuke?</b>	<b>118</b>
6.4.1	Schumacher's Ethical critique	119
6.4.2	Against the 'Other'	121
<b>6.5</b>	<b>Recruiting anti-nuke activists</b>	<b>123</b>
6.5.1	The anti-nuke movement in the US	124
6.5.2	The Critics speak out	125
6.5.3	Anti-war radicals turn anti-nuke	126
6.5.4	UK import US expertise	129

<b>7.</b>	<b>Energy Utopianism: the search for a perfect energy source</b>	<b>131</b>
<b>7.1</b>	<b>Energy and Society</b>	<b>131</b>
7.1.1	Basalla's Energy utopianism	132
7.1.2	Electro-propaganda	133
7.1.3	Critics	134
7.1.4	Techno-arcadia	135
7.1.5	Opposition to pylons	136
7.1.6	Opposition to dams	137
<b>7.2</b>	<b>The Nuclear Age</b>	<b>140</b>
7.2.1	The atomic bomb: Doomsday or paradise	142
7.2.2	Atoms for Peace	143
7.2.3	Nuclear Power comes on line	145
7.2.4	Nuclear euphoria in Britain	147
7.2.5	The end of the nuclear dream	149
<b>7.3</b>	<b>Solar energy: a long standing dream</b>	<b>150</b>
7.3.1	19th Century Solar Utopias	150
7.3.2	Solar v atomic energy	152
7.3.3	Solar as Hip	153
<b>8.</b>	<b>Conclusion</b>	<b>155</b>
<b>8.1</b>	<b>Reasons for opposition</b>	<b>155</b>
8.1.1	NIMBY concern	156
8.1.2	Vested interest	157
8.1.3	Intellectual dissent	157
8.1.4	Opportunistic	158
<b>8.2</b>	<b>The two anti-nuclear campaigns</b>	<b>160</b>
8.2.1	Stourport Protest	162
<b>8.3</b>	<b>Origins of anti-nuclear power attitudes</b>	<b>163</b>
<b>8.4</b>	<b>FoE Hagiology</b>	<b>165</b>
8.4.1	FoE Expertise v ConSoc democracy	166
8.4.2	FoE retrospective	168
8.4.3	Emotion versus expertise	170
8.4.4	Green Alliance	171
<b>8.5</b>	<b>Soft energy utopianism</b>	<b>172</b>
8.5.1	A nuclear revival?	173
	<b>References.</b>	<b>176</b>
	<b>Footnotes</b>	<b>187</b>

## Acknowledgements

I would like to acknowledge first and foremost the encouragement and support of Professor Dave Elliott as my supervisor, who was willing despite a heavy workload to accept me as a student and who has always given prompt and useful suggestions. I would also like to thank Professor Phil Steadman for encouraging me to enroll for a Ph.D., to Jill Sutcliffe and others for persuading me not to quit, and to Olive, my partner, for her constant questioning as to when I was going to be a 'Doctor'.

I would also like to thank Sheffield Archives, Worcestershire County Council Records Office and Cambridge University Library for allowing me access to their collections, and to the Open University Library for their helpful and speedy services.

Finally thanks to the UK section of the European Association for Environmental History, for their annual conferences at which I was able to present parts of this thesis, and gain confidence in my ability to write the rest.



<b>Figures</b>	<b>Page</b>
Figure 5.1 Scheme of ideas distinguishing nature from culture.	88
<b>Tables</b>	<b>Page</b>
Table 5.1 Date of Founding of Major ‘Environmental’ Groups illustrating change in terminology.	99

## Acronyms and Abbreviations

AEA	Atomic Energy Authority (UK)
AEC	Atomic Energy Commission (USA)
AGR	Advanced Gas-Cooled Reactor
ANC	Anti Nuclear Campaign
ANS	Associated Nuclear Services
APS	Anti-Powerport Station
ASEH	American Society for Environmental History
AT	Alternative (or Appropriate) Technology
BNFL	British Nuclear Fuels Ltd. (UK)
CANTO	Concerns Against Nuclear Technology Organisation
CEA	Central Electricity Authority (UK)
CEGB	Central Electricity Generating Board
CFR-1	Commercial Fast Reactor No. 1
CN	Conservation News
CND	Campaign for Nuclear Disarmament
ConSoc	Conservation Society
CPRE	Council for the Protection of Rural England
CPRW	Council for the Protection of Rural Wales
DEn	Department of Energy (UK)
DoE	Department of the Environment (UK)
DTI	Department of Trade and Industry
FBR	Fast Breeder Reactor
FoE	Friends of the Earth (UK)
GMWU	General and Municipal Workers Union (UK)
ICRP	International Commission on Radiological Protection
IUCN	International Union for the Conservation of Nature
KS	The Kidderminster Shuttle (UK)
KT&SN	Kidderminster Times & Stourport News (UK)
LOCA	Loss of Coolant Accident
LWR	Light Water Reactor
MP	Member of Parliament
NCB	National Coal Board (UK)
NIMBY	"Not in my Backyard!"
NIN	Nuclear Information Network (UK)
NNC	Network for Nuclear Concern
NS	New Scientist
NSM	new social movements
NUM	National Union of Mineworkers (UK)
NUS	National Union of Students (UK)
NY	New York (USA)
PERG	Political Ecology Research Group (UK)
PG&E	Pacific Gas and Electric (USA)
PWR	Pressurized Water Reactor
RSPB	Royal Society for the Protection of Birds
RSPCA	Royal Society for the Prevention of Cruelty to Animals
SCRAM	Scottish Campaign to Resist the Atomic Menace
SEI	Society for Environmental Improvement
SERA	Socialist Environment and Resources Association (UK)
SF	Science fiction
SGHWR	Steam Generating Heavy Water Reactor
TCPA	Town and Country Planning Association (UK)
TGWU	Transport and General Workers Union (UK)
THORP	Thermal Oxide Reprocessing Plant
TVA	Tennessee Valley Authority (USA)
UC	Undercurrents (UK)
UCS	Union of Concerned Scientists (USA)
UK	United Kingdom
UN	United Nations
USA	United States of America
WA	Windscale Appeal
WHO	World Health Organisation
WCC	Worcestershire County Council
WWF	World Wildlife Fund

# **1. Introduction: a search for the roots of the UK anti-nuclear power movement.**

This thesis is about the growth of the anti civil nuclear power movement in the UK from 1955 to 1979. It seeks to explore why it emerged at the time and in the form it did. It challenges some of the existing histories and associated explanations of the processes involved, and provides new explanations as to how and why, and indeed when the anti-nuclear movement emerged. The period chosen covers the time from local opposition at the first Public Inquiry into a proposed nuclear reactor at Bradwell in 1956, to the impact of the Windscale Inquiry Report on the national anti-nuclear power movement in 1978. A cut-off date of 1979 is selected as this marks the divide between the moderate tactics adopted by the then largest environmental groups, Friends of the Earth and the Conservation Society, and the more militant direct action approach of new organizations, like Greenpeace, the Torness Alliance and the Anti-Nuclear Campaign. It is not a policy history, but a history of activism based on accounts collected from the contemporary literature and from the activists.

The hypothesis for this thesis is that an anti-nuclear power movement emerged in UK in the 1970s because of long standing concerns of a minority over the dangers of 'atomic energy' and the continuity of opposition to the building of nuclear power stations. The divisions within the nuclear establishment over reactor choice in UK (and radiation and safety standards in US) gave new radical groups- the environmentalists - an opportunity to build a movement using new tactics of protest. This chapter first sets this thesis in the context of the traditional anti-nuclear histories, then outlines the structure of the thesis and its sources, and then explains its methodology.

## **1.1 Old nuclear explanations**

The official histories written from both the pro and the anti nuclear viewpoint both give common explanations about how and why, and indeed, when the anti- nuclear movement emerged. But these explanations are being challenged as myths by a new generation of researchers, particularly Ian Welsh, in his book *Mobilising Modernity* (2000). The traditional explanations are:

- There was only opposition to nuclear power since the early 1970s.
- Prior to this there was a 'golden age of public acceptance'.
- Friends of the Earth (FoE) started and led the anti-nuclear movement.



- The activities of the anti-nuclear and environmental movements led to nuclear power's demise.

Similarly O'Riordan divided the life cycle of civil nuclear power in UK into four distinct ages, the first being 'the age of innocent expectation' from 1946 to 1966 years which he claims were characterised by innocence and euphoria, followed by 'the age of doubt' from 1967 to 1974, 'the age of anguish' from 1975 to 1980, and 'the age of public justification' from 1981 onwards (O'Riordan 1986: 42).

Instead this thesis, drawing on the ideas of Welsh and other, gives a generally new account that shows that anti-nuclear feeling arose from:

1. long standing public ambivalence over 'atomic energy'.
2. disillusionment with claims of 'nuclear utopia'.
3. the continuity of protest over the building of nuclear reactors
4. a small network of activists, from a wide variety of backgrounds.

This thesis hopes to provide both a narrative account and an explanation for the rise of the anti-nuclear power movement in the UK in the 1970s. It seeks to answer the question: why an anti-nuclear power movement instead of an anti-coal or anti-asbestos movement. What was it about nuclear power that generated such opposition? Its environmental impact, its cost, its prospects or its symbolism?

## **1.2 Structure of thesis**

The thesis is divided into two parts: the first mainly historical and the second mainly theoretical. The first part of this thesis - Chapters 2 to 4, gives a historical account of early criticism and protest over nuclear power through to the Windscale Inquiry in 1977. The second part, consisting of chapters 5 to 7, is based on literature surveys, interviews with anti-nuclear campaigners and research on archive material. It identifies and discusses what I consider the key concepts of 'the environmental impulse', 'nuclear fear', and 'energy utopianism'.

### **1.2.1 Part 1: Anti-nuclear activism**

Chapter 2 to 4 outline the growth in anti-nuclear activism in Britain, from the early public inquiries in the 1950s to the aftermath of the Windscale Inquiry in 1977. Chapter 2 cover early criticism and opposition to nuclear power before FoE involvement. Firstly protest at the 1950s public inquiries, then the National Coal Board's campaign in the mid 1960s, Schumacher's critique in 1967, and details on the largely unknown local campaign against the proposed Stourport AGR in 1970. Chapter 3 covers the rise of environmentalist opposition in the early to mid 1970s, firstly a few articles in the eco-press, then a campaign by activists from the



Conservation Society and local groups, like Half Life, which attracted little support or attention. At the end of 1975 FoE was able to exploit massive publicity on the proposed THORP plant at Windscale, and launch its own high profile campaign. This chapter finally covers the network of groups that appeared in response to this publicity. Chapter 4 details the difficulties the diversity of groups had in presenting a united case at the Windscale Inquiry, their uneasy relationships with FoE, and the reactions of FoE, ConSoc and the anti-nuclear movement to the Inspector's decision.

### **1.2.2 Part 2: Ideas and explanations**

The second part of this thesis - Chapters 5 to 7- analyses the events in the first Part, seeking to explain who were these anti-nuclear activists and why they chose to protest about nuclear power. It explores the ideas and concepts behind the academic analysis of the anti-nuclear movement, and outlines previous research in this area. Chapter 5 explores why and how people become environmental activists by looking at the nature of the 'environmental impulse' and of 'social movements', the making of 'activist identity' and their recruitment into groups. It draws on the work of Joe Weston (1989) and Derek Wall (1999) and illustrates how existing activists are recruited into new groups, such as Friends of the Earth (FoE), and how these new groups establish their identity through new styles of protest or 'repertoires of action', in this case the Schweppes bottle dump in 1971.

Chapter 6 gives an explanation for the rise in the anti-nuclear power movement. The chapter first outlines how science fiction from the very beginning ambiguously portrayed the 'atomic' future, and how post war, its vision was mainly bleak due to fear of nuclear holocaust caused by the atomic bomb, and how this ambiguity was reflected in uneasy support for nuclear power in the opinion polls. It then looks at the 'anti-nuclear impulse', the emotional forces that cause people to become anti-nuke. This analysis draws heavily on the work of Spencer Weart (1988) who uses the term 'nuclear fear' to explain opposition to nuclear power, and how this fear is heavily influenced by images of the nuclear bomb in popular culture. The fourth section looks at the growth of anti-nuclear groups, drawing on sociological work which explains activist recruitment in terms of 'friendship networks', and gives personal explanations for being 'anti-nuke', many obtained by the author in interviews with leading 1970's anti-nuclear activists in the UK. The fifth section illustrates these explanations and reasons through examining the rise of anti-nuke opposition in the United States from the late 1960s and the recruitment of anti-nuclear activists from the anti-war movement.

Chapter 7 shows how post war official optimism about nuclear power was part of the long tradition of 'energy utopianism' - the belief that a new energy source could transform the

technical and social life of society (Basalla 1982). This 'energy utopianism' is illustrated with details of how hydro-electricity and nuclear power were initially greeted with wide enthusiasm and hyperbole. Then as each source failed to achieve its over-hyped expectations, disillusionment and criticism rapidly set up.

The chapter concludes with an examination of long held hopes for solar energy, dating back to public enthusiasm in the late 19th century. Post WW2 hopes for solar was dashed by nuclear power, but it was rediscovered by the AT movement in the 1960s and vigorously promoted by environmentalists as an alternative to nuclear power from the 1970s.

The final chapter concludes with:

- a summary of the wide-ranging motives for anti-nuclear activism.
- the similarity in arguments between the 1960s and the 1970s anti-nuclear campaigns.
- criticism of previous histories caused by their excessive attention to FoE's role in the 1970s campaign.
- the validity of 'emotion' and 'nuclear fear' as a valid reason for anti-nuclear feeling.
- speculation, based on the history of energy utopianism, as to the future of solar (now termed 'renewable') energy and whether there could be a nuclear revival.

### 1.3 Methodology

This thesis takes an interdisciplinary approach to describing and analysing the history of the anti-nuclear movement, but draws heavily on the literature of environmental history and (some) concepts from 'social movements' research. It uses previous ignored literature and archives to illustrate its arguments. These sources are:

- An account of the NCB campaign during 1960s against the expansion of nuclear power, and the anti-nuclear critique developed by Schumacher.
- Research on Worcestershire County Council archive material on the campaign against the proposed building of nuclear plant at Stourport in 1970 illustrating the import of American criticism of radiation standards.
- Research on ConSoc documents showing the start of the anti-nuclear campaign by a handful of activists from ConSoc, helped by the eco-press, with FoE members initially uninterested.
- Analysis of internal movement reports and interviews showing the repercussions of the anti-nuclear power movement's defeat at the Windscale Inquiry in 1977: media glory for FoE, a fiasco for ConSoc and much internal recrimination.



### 1.3.1 Environmental History

The roots and shades of modern environmentalism are deep and complex and are beyond the scope of this thesis. Many academics have devoted themselves to uncovering them, and one such author David Pepper argued that to understand them “*we must develop an historical perspective on how we and others have arrived at our present state of attitudes*” (Pepper 1984: 3). It is this that the discipline of Environmental History, to which this thesis subscribes, seeks to do.

Environmental History is an academic discipline that focuses on the history of the environment and the history of environmentalism. One of its founding fathers, Donald Worster has defined it as “*the interdisciplinary study of the relations of culture, technology and nature through time*” (Worster 1993: viii). It stresses the importance of continuity of events, and the linkages between eras. As Samuel Hays comments (2000: 226):

*“Events are embedded not only in circumstances: they are also embedded in the flow of time. each succeeding event or circumstance is related closely to a preceding one. It is difficult, if not impossible, to understand a point in time without placing it in its evolutionary context. This is not just a view of history that links events past to events present. More important, it is an understanding that emphasizes the way one thing grows out of another, it arises from the old and then becomes something a bit different”.*

The second prong of Environmental History, the history of ‘environmentalism’ or of ‘environmental movements’ is not so well developed. Generally the histories written of environmental groups has either been written by activists or their supporters, such as Robert Lamb’s *Promising the Earth* (1996) on FoE. There are few critical and original works. Those that are, like Anna Bramwell’s *Ecology in the 20th Century* (1989) have proved controversial, while others like Joe Weston’s *The FOE Experience* (1989), Meredith Veldman’s, *Fantasy, the Bomb and the Greening of Britain* (1994) and Martin Holdgate’s *The Green Web* (1999) attract little attention. Environmental History, labeled ‘Green History’, is however popular when the ‘lessons from history’ (on soil erosion, deforestation, pollution etc) are used to support green activism. A notable example of this genre is the writings of Derek Wall, a green activist and prolific green historian (Wall 1994a; 1994b; 1996; 1999), as well as the best seller *Green History* (1991) by Clive Ponting.

### 1.3.2 The purpose of environmental history

The appropriate relationship between environmental history and the environmental movement is problematic and was debated at the last two ASEH meetings in 2001 and 2002 by Donald Worster and Samuel Hays.<sup>1</sup> At the 2001 ASEH meeting Donald Worster, according to Samuel Hays, argued that the main audience for environmental historians was the environmental

movement and their main task was to help the movement understand itself and debate the vital relationship between humans and nature (Hays 2002). Hays, believing that Worster's views were mistaken, urged that "*we look to the entire society, not just the environmental movement as our audience, and use an historical rather than a movement perspective as a vehicle for asserting to the world at large the importance and human relevance of environmental affairs*" (Hays 2002). Furthermore Hays believed that environmental historians tend to be remote from the movement and thus ill placed to understand their concerns.

Historians, he argued "*are part of the environmental intelligentsia which is preoccupied with sorting out ideas rather than the environmental movement which is preoccupied with action*" (Hays 2002). Thus they should concentrate on truly historical questions that go much deeper and deal with more comprehensive issues than movement history. Hays' comments on the remoteness of historians from activists was challenged in the subsequent email discussion, with Richard Grove making the point that: "*In my experience a high proportion of environmental historians came into the field as a direct result of their involvement in environmental campaigning*".

This is certainly true for many British authors writing accounts of the history of environmental movements. Joe Weston was a leading FoE activist for over 10 years, Derek Wall was a notable Green Party activist and anti-roads campaigner; and Ian Welsh was active in SCRAM, the Scottish anti-nuclear group, while older writers like Michael Allaby were active in the organic movement, Martin Holdgate in the IUCN, and Walt Patterson in FoE.

Too close an involvement with movements can of course damage ones 'objectivity' but too great a distance can damage ones 'understanding' of movement motivation. Also academics and activists have different objectives in research: as Phil McLeish, an anti-roads activist, said to Derek Wall academics tend to ask "*why social movements exist, [whereas] activists want to know how to win*" (Wall 1999:8).

There is, perhaps not surprising in the small world of academic research, a continuity of activists turned academics. For instance Derek Wall's Ph.D. supervisor was Ian Welsh, who in turn studied under Brian Wynne, a participant at the Windscale enquiry in 1977, and Paul Smoker, the founder of Half-Life, Britain's first anti-nuclear power group in 1975.

The links stretch back even further to pre-war activism: Derek Wall discovered after his viva that the father of Harry Rothman, his Ph.D. examiner, had led the Kinder Scout Trespass in 1932 (Wall 1999: xii).



### 1.3.3 Activist literature

This thesis is influenced by my earlier criticism of academics in search of explanations to concentrate not on intellectual texts but on activists literature. For in my review of David Pepper's book *Modern Environmentalism* I complained (Herring 1996: 778):

*“What is the relation between the -isms and the -ists? That is how influential and widespread are the ideas, the environmentalism, amongst the people who do the action, the environmentalists? How many dreadlocked protesters against the Newbury by-pass have read Bookchin, how many little old ladies demonstrating against animal exports subscribe to The Ecologist ?*

*What is missing from this book is the voice of the activists, and their little magazines and pamphlets that rarely appear in university libraries. They are the voice of modern environmentalism not the books by Edward Goldsmith or Murray Bookchin. Their voice has not been heard as their history of environmental activism since the 1960s has not yet been written”.*

Since then several works have appeared along these lines, and my inspiration here are the books *Senseless Acts of Beauty* (1996) and *Earth First!* (1999) by respectively the activists and academics George McKay and Derek Wall. These books draws on a wide range of sources: activist papers and diaries, interviews and even record lyrics. This thesis follows that historical tradition in giving primacy to the voice of activists rather than the few intellectuals who claimed to speak in their name. In doing so the role of women anti-nuclear activists may be much more appreciated, for few of them in the 1970s wrote books or even magazine articles.

### 1.3.4 Insider accounts

Theoretical perspectives produced by academics must of course be heeded and are to some extent valid but theory alone is not sufficient to explain the emergence of what sociologists call an ‘activist identity’. As Wall comments, in his book which examined how green movements are produced and change, *“accounts that explain participation in terms of identity, and imply that identity grows from a single factor such as class or upbringing or whatever, are inadequate”* (Wall 1999: 96). Wall believed that an over-theoretical approach is unhelpful to explaining participation. He wrote *“Theoretical perspectives can, of course, suffocate accounts of living movements with lofty, opaque and often irrelevant intellectual baggage”* (Wall 1999: 15).

Wall's approach instead is to ask movement activists how they got involved, to read movement literature, and to reassess his own experience as an activist.

Similarly Joe Weston, a FoE activist in the 1970s and 1980s, believes that theoretical analysis of groups do not convey the intricate relationships which exist either between itself and the rest of

society or between the individuals which run the group and organize its activities (Weston 1989: 5) In his history of FoE he stated *“In attempting to locate groups within a theoretical knot-hole it is so often forgotten that those groups are made up of individuals and that some individuals can have a massive influence over the character of a whole organisation”* (Weston 1989: 5). Citing the work of Andy Blowers (1980) he believes that the examination of politics and political organizations from the ‘inside’ makes possible a far greater insight and understanding of internal clashes, faction fighting and consequent organization change than any empirically based ‘scientific’ study could ever achieve. Weston in his study of FoE argued that, it is only through *“the witnessing and reporting of these clashes and changes that a true ‘taste’ of Friends of the Earth can be transmitted and understood and as a result a fuller understanding of green politics as a whole can be achieved”* (Weston 1989: 10).

This thesis also aims to follow the tradition of environmental history in being written in clear prose that is accessible to the non-specialist reader. Its model here for clarity and readability is a recent book *The Origins of the Organic Movement* (2001) by Philip Conford, although one reviewer complained it had a ‘propensity to under-theorise’ (Reed 2002: 216). This thesis will plead guilty to that academic crime as well as the charge of being ‘over referenced’. The copious reference in this thesis, particularly to the texts in movement magazines available in only a few libraries, is intended as a help for future researchers. I also provide footnotes which appear at the end of the thesis, which provide further sources of information. Thus this thesis is written in the knowledge that there is little written on British post war environmental activism in the 1960s and 1970s and in the belief that there should be much more.



## **2. Nuclear criticism and protest 1955: 1970**

This chapter and the next one challenges the conventional view as put forward by Wolfgang Rudig that “*practically all anti-nuclear opposition before the late 1970s was expressed within the public inquiry system in Britain. There were no demonstrations, pickets, or any other signs of protest which local opposition groups would consider to adopt outside the inquiry procedure*” (Rudig 1990: 119). This chapter refutes this by giving an outline of the National Coal Board’s (NCB) campaign in the mid 1960s against the expansion of the nuclear industry in the 1960s, and Schumacher’s ethical critique of nuclear power in 1967. It also gives extensive details on a local campaign against a proposed AGR at Stourport on Severn in 1970.

The chapter starts with early specialist criticism about the scale and costs of the Government’s proposed nuclear plans. It then covers most of the 1950s public inquiries giving attention to objectors’ environmental concerns. These early concern over protection of nature, the cost of economic growth, and the dangers of radioactivity were issues which were to resurface in the 1970s campaigns.

### **2.1 Early Specialist criticism**

O’Riordan has characterised the first 20 years of the UK new power program as one of innocence and euphoria, “*where powerful men backed by powerful organisations ruled with a combination of arrogance and complacency*” (O’Riordan 1986: 42). Until the 1970s criticism of nuclear power was restricted to specialist journals, elite newspapers (generally The Times), Parliament and industry forums. Overall nuclear power was seen by nearly all the establishment as part of “*the white heat of an oil-free technology that would bring Britain into a new age of prosperity*” (O’Riordan 1986: 42). The 1953 White Paper (HMSO 1953), on the organization of the atomic energy industry, was generally well received by the press, although there were reservations about the power and the autonomy of the proposed UKAEA.

The 1955 White Paper (HMSO 1955), on the first nuclear power programme, was greeted with even more acclaim by the press, “*with the sole expression of reservation*” in the ensuing HoC debate a solitary question on the measures for the disposal of nuclear waste (Welsh 2000: 56). The 1957 Electricity Act, following the triumphal opening of Calder Hall (see Welsh 2000: 56-8) in October 1956, was a further opportunity for the Government to promote nuclear euphoria and triple the expansion of the nuclear industry. However expression of nuclear optimism from within scientific and political circles did not go completely uncriticised. A small group of parliamentary backbenchers raised a series of issues, including reactor safety, the adequacy of plans for nuclear waste disposal, the dangers of low-level radiation and the absence of any

integrated energy policy (see HCD 569: 57, 136, 157). In response the Government was 'perplexed' at the expression of 'anxieties which it is not usual to hear' (Welsh 2000: 63). Both The Times and The Economist were critical of the tripling of the nuclear programme, calling it too ambitious. The Times commented "*Atomic energy has the power to evoke fantasies. It is not only looked on as an 'answer to Suez' but as a fairy godmother source of cheap electricity*" (Times 1957). It further cautioned against prophets who visualize that in twenty years time there will be "*electricity on tap in every home like water, laid on for a low fixed charge irrespective of the quantities consumed*". The Times unswayed by the myth of cheap atomic energy warned that "*The hard fact is that electricity from the first atomic power stations will be dearer, not cheaper, to generate than power made in new coal-based stations*" (Times 1957).

In conclusion The Times argued in favour of a more balanced approach to energy, including the underground gasification of coal, rather than a massive financial commitment to nuclear. This latter criticism was echoed by The Economist (19 January 1957) who protested against "*the immense capital expenditure*" before "*the first atomic power stations had time to prove themselves*". However according to Welsh "*Such concerns could scarcely be heard within the overall climate of adulation*" (Welsh 2000: 64). Even internal critics like Hinton who viewed the trebling of the programme as "*complete madness and I said so but I was just a voice crying out in the wilderness*" went unheeded (Welsh 2000: 64).<sup>2</sup>

### 2.1.1 Stretch Critique

One vocal critic from within the AEA was Kenneth Stretch, works manager at Calder Hall from 1954-7, who argued against the dominance of theoretical work as a guide to policy development. According to Williams he put forward in the journal Nuclear Power in December 1958, "*A rare and powerful critique of British nuclear economics*" (Williams 1980: 73). Stretch, commenting on a lecture the previous year in Sweden by Hinton (1957), questioned both Hinton's cost forecasts for nuclear electricity and the wisdom of so large a commitment to one reactor system (Stretch 1958). Williams commented "*Stretch's analysis of Hinton's figures suggested to him that they were 'seriously biased in favour of nuclear power'. Hinton's estimate of coal costs was already too high while his estimate of nuclear fuel costs had no real evidence to support it*" (Williams 1980: 73). Stretch himself did not expect nuclear power to be competitive with coal until 1980-90. It was therefore "*extremely rash for this country to rush into building a large number of obsolescent nuclear stations*" and over optimistic forecasts of nuclear costs were "*likely to rebound very awkwardly*" (quoted in Williams 1980: 74).



Although Stretch's paper was published in a prominent journal and was drawn to the attention of ministers in parliament, it was ignored by both Hinton who 'never troubled to read it', and the AEA (Welsh 2000: 64). Stretch, according to Welsh (2000: 64) was harshly treated for his criticism, he was ostracized by his colleagues and became known with the AEA as 'The Renegade'. He eventually resigned to teach engineering in Birmingham, and he further expanded his ideas on the nuclear power industry and failings of modern science in a book published in 1961 (Stretch 1961). Hinton only acknowledged the truth of Stretch's critique in 1975, admitting that it was an "*over ambitious nuclear programme*" in a retrospective review of nuclear policy in a House of Lord debate, and in an article published in New Scientist, in October 1976 (Hinton 1976).

### 2.1.2 1960s Fuel policy

Most criticism in the 1960s was of the decisions made on the speed, scale and reactor choice of the nuclear program, not of the nuclear project. In the early 1960s the AEA forecasts were quickly proved in several respects over-optimistic: the Magnox reactors took longer and cost more to build than expected, while the cost of power from coal fell. The formation of OPEC in 1960 was generally dismissed, except by Fritz Schumacher at the NCB who continually prophesied on the dangers of oil dependency. Similar views were expressed in a letter to The Telegraph on 15 August 1961 by Captain Herbert Atkins, whose later criticism of the AEA, over its marine reactor system and its monopoly position as both designer and assessor of reactors, was reported in The Guardian of 21 February 1963.<sup>3</sup> His immediate dismissal from Vickers created a political storm which resulted according to Pocock in the AEA never again be able "*to enjoy the freedom from criticism that it had known since the early days of Calder Hall*" (Pocock 1977: 141).

The secrecy of the deliberations on reactor choice by the Powell Committee<sup>4</sup> had by 1964, bought criticisms of excessive nuclear secrecy from the press. The opinion of Nature (27 June 1964 pp1247-8) was not untypical "*the secrecy maintained over the proceedings of the Powell Committee is indefensible*", and New Scientist (19 March 1964) complained about "*poorer decisions were to expected from a secret technocracy than from a more open policy system*". The nuclear programme attracted criticism from academics of the period, who were very critical of the size of the first nuclear programme, and of the decision to concentrate on one reactor type alone. Typical of such criticism was the work of Mary Goldring who believed that worst mistakes of the nuclear power programme were its rigidity and inflexibility. She warned in 1964 that "*Too much atomic planning is done by people pushing atomic power*", and that cost estimates are "*games played by accountants*" (Goldring 1964: 12; 14).



However the decision to choose the AGR, rather than the LWR, for Dungeness bought rave reviews for the nuclear industry. Williams wrote *“Echoing 1955 the British press gave the AGR’s success an enthusiastic, and mostly uncritical, reception. The stock words were used: ‘triumph’, ‘breakthrough’, ‘decisive advantage’ ”* (Williams 1980: 145). He notes however, based on critical reference in the non British technical press such as Euronuclear, that *“Few outside the technical community recognized, however, it was on the basis of the CEGB’s assumptions and not on basic technological and economic merit that the AGR had won”* (Williams 1980: 145). One vocal critic of the AGR decision was Duncan Burn, whose book criticising the AEA’s monopoly over R&D (Burn 1967) *“caused a sensation and prompted many influential personalities within the industry to commit themselves either to Burn’s attitudes or to the defense, as they saw it, of the Atomic Energy Authority”* (Pocock 1977: 183).

The years 1965-68 had two White Papers on Fuel, in 1965 and 1967, accompanied by much internal fighting between the coal and nuclear industries, and extensive newspaper coverage on the (bleak) future for coal and (rosy) prospects for nuclear. The most organized opposition to nuclear was from the coal industry led by Lord Robens<sup>5</sup>, the Chairman of the NCB (see section 2.3). He was described by Pocock *“as one of the most severe critics of the nuclear power programme, which he saw as the principal threat to the mining industry and an outspoken man and formidable opponent; from early 1966 he was in conflict with a Minister of Power who had a similar reputation - Richard Marsh”* (Pocock 1977:172). Such was the threat to coal from nuclear that the NCB took the highly unusual step of effectively dissociating themselves from the Government’s fuel policy in its Annual Report for 1966/67. It argued (quoted in Williams 1980: 155):

*“Estimates that the cost of providing electricity from nuclear stations will be less than the cost of doing so from thermal stations need close and dispassionate examination. Nuclear stations cost huge sums in capital and account needs to be taken of the use to which excess capital expenditure could be put if it were not sunk in these stations. To the extent that the basic technology remains unproven, the justification for spending these large sums of capital must be open to question”.*

The 1967 White Paper was meant to resolve these economic questions but as Robens commented *“No doubt the Labour Government thought that when the White Paper was published in 1967 the public debate about the relative merits of nuclear power and coal would come to an end. On the contrary, I continued to clamour for an independent inquiry into these matters”* (Robens 1972: 166). In desperation the NCB commissioned a report from the Economist Intelligence Unit, which was published in September 1968, but the Ministry of Power rejected its ‘middle of



the road policy' (Williams 1980:168). A further critical report of Government policy came in 1968 from the Brooking Institute which concluded "*Coal output should probably be cut back more slowly than is planned and the investment programme for electricity (especially nuclear generation) should be substantially reduced*" (Caves et al 1968).

However overall nuclear had a very good press in the 1950s and 1960s, and the few critics, like Stretch, Burn and the NCB were easily dismissed. The next sections look at protest against the building of nuclear power stations, firstly in the 1950s, then by the NCB and the coal industry in the 1960s, and finally by the inhabitants of Stourport in 1970.

## 2.2 The 1950s Public Inquiries

Between 1956 and 1961 there were 7 public inquiries into proposals to build Magnox stations.<sup>6</sup> The first (commercial) Magnox, at Berkeley in 1955, was approved without an inquiry but from then on every Magnox, except Sizewell A in 1960, was subject to an Inquiry lasting from 2 to 5 days. This compares to all 5 AGRs built without an inquiry in the 1960s. In fact there was a 10 year interval (1961-71) without an inquiry. The 1970s saw a return to nuclear inquiries. In 1971 there were two: the first over Connay's Quay lasted 28 days during March and April (DTI 1971a), and the second over Portskewett for 3 days in June (DTI 1971b). Then in 1974 there was an 8 day inquiry over Torness followed by the marathon 100 day inquiry over the Windscale THORP plan in 1977.

Brian Rome, a law lecturer and Conservation Society Activist at Bristol Polytechnic in the 1970s and 80s, compiled extensive indexes of all nuclear power inquiries. Writing in 1979 he believed "*that past inquiries contain much information relevant for forthcoming ones*" and that these "*will involve disputes on specific issues MOST of which were disputed in 1956/77 nuke P.I.s and that many grounds-of-objection will be as relevant and valid in 1980 as they were in the Magnox days*" (Rome 1979b). In his 1979 *Index to Past Public Inquiries*, Rome (1979b) provides references to previous inquiries to show that the issues of need, non-nuclear alternatives, reactor safety, emissions, economics, and accidents which dominated the 1970s anti-nuclear campaign had already been raised in the 1950s. In his *Index* the need for nuclear power was raised at the Bradwell inquiry in 1956, at Hinkley in 1957, at Trawsfynydd in 1958 and Wylfa in 1961. Reactor safety was an issue at Bradwell, Trawsfynydd, Dungeness and Oldbury, while economics was raised at Bradwell, Oldbury and Wylfa. As the public inquiries progressed the range of objections widened from initial concerns on amenity, nature conservation and economic interest to what Rudig described as "*a far more sustained attack in terms of the safety and economics of nuclear power*" as occurred at the Oldbury inquiry, held in April and May 1960 (Rudig 1990: 116). However national press coverage of the inquiries was mostly confined



to short reports or letters, mostly on wildlife or amenity issues, with local press giving more space to opposition groups.

### 2.2.1 Bradwell

The first Public Inquiry over a nuclear power station occurred at Bradwell-on-sea, Essex in April 1956. Initially Aubrey Jones, the Minister of Fuel, hoped it might be possible to avoid an inquiry but opponents of the scheme exploited the contradictions in the siting criteria. If nuclear was as safe as conventional industries why must it be placed in remote rural areas? The local MP, Brian Harrison, had taken informal soundings at the beginning of 1956 and found that the safety issue had been “*worrying local residents more than anything*” (Luckin 1990:174).

Although large number of villagers, at a parish gathering in March, declared themselves in favour of the scheme, the opponents, who included national figures like Tom Driberg<sup>7</sup>, ex MP for the area, and John Betjeman, a conservationist for Victorian architecture and later to become Poet Laureate, were better organized and better able to influence public opinion through use of local media. The opposition formed the Blackwater and Dengie Peninsular Protection Association (BDPPA) with the intention of ‘creating the strongest opposition’, to the project by running a ‘campaign to excite national interest’ (East Anglian Daily Times 26 May 1956). By mid March the Minister of Fuel had received more than 150 formal objections, and therefore had little option but to sanction a public inquiry. The BDPPA reflected two sets of organized local interests centred around the oyster industry and local sailing enthusiasts. According to Welsh it also acted as a focus around “*which a much more diverse and less clearly focused range of objections coalesced*”, many from outside the local area (Welsh 2000: 73).

The Inquiry lasted five days from 26 to 28th April and on 8th and 9th May and is covered in detail by Luckin (1990: 174-8) and by Welsh (2000: 74-81). It was, as the Inspector noted, well attended by the public with objections received from afar afield as Somerset and the Midlands. The Inspector however judged the evidence submitted purely in terms of expert testimony on amenity, the alleged danger to the oyster fisheries, and the toredo worm. The everyday fears and suspicions of the objectors were dismissed as ‘unreal’. As Welsh commented “*The concerns of the objectors which had been expressed in such impassioned terms were thus defined away as being real only within the confines of the Inquiry. Subjected to the rigours of the ‘real world’ they would dissolve away into ‘unreality’*” (Welsh 2000: 79). This left only the testimony of the two expert witnesses for the objectors on the possible damage to the oyster beds and the prospect of an increase in ‘torpedo worms’ and ‘gribble’ which were detrimental to yacht hulls. According to Welsh “*The Inspector dispatched their evidence by recourse to a childhood reminiscence of a summer spent watching the oyster fisherman of Whitstable. From his extensive*



study, the Inspector concluded that "oyster culture was a very chancy business" and that "one cannot always account for a bad harvest" " (Welsh 2000: 79). Finally the Inspector dismissed the amenity issue which was "an emotional one upon which the whole opposition case hinged" by saying that amenity must bow to the face of progress and the inevitability of change which was already occurring (Welsh 2000: 79).

#### **2.2.1.1 National media coverage**

- The coverage by the national media was patchy, and there were no in-depth feature articles as there had been for the Magnox reactors at Calder Hall.<sup>8</sup> Objectors fears about nuclear safety went unreported; the press tended to follow the prejudices of the Inspector in its reporting, with headlines described by Welsh as 'verging on the inane at times' (Welsh 2000: 81). The Minister of Fuel, Aubrey Jones, under pressure to keep to a demanding nuclear timetable, accepted both his Inspector's report without qualification and his dismissal of the objectors' case (Luckin 1990:178). Objectors were left to plead their case through the letters column of the national press. The objectors wrote to every MP arguing that their case had not been given adequate consideration and urging that the inquiry be re-opened (The Times 23 May 1956). Their plea fell on barren ground. As Welsh commented: (Welsh 2000: 81):

*"At the level of the local inquiry the status, prestige, and unassailable position of nuclear expertise were sufficient to ensure the success of the CEA's application. At the national level the tendency to accord status to the pronouncements of the Inspector at the Inquiry, and the overall enthusiasm for the nuclear project, combined to ensure that the reservations of the objectors over nuclear safety found little expression. At the national level the unassailable position of the nuclear enterprise remained inviolate".*

#### **2.2.2 Hunterston**

The Inquiry to build a Magnox station at Hunterston, on the Clyde in Scotland, lasted 11 days, and was held between the 29th January and 13th of February 1957. It was re-opened briefly on June 14th to enable an Inspector's Report to be submitted as the original Inspector had died in the intervening period. The proceedings were published as a White Paper issued by the Scottish Office (HMSO 1957). Objections were received from forty individuals and organizations. These included an individual from Kent and a petition bearing 208 signatures. Unlike Bradwell no commercial interests were represented. In this case the major objector was the Hunterston Estate upon whose land the station was to be sited. Objections covered both nuclear and non nuclear concerns. The former were about the 'effect of radioactive dust and fumes' and their implications for human life and flora and fauna of the area. The latter covered the loss of agricultural land; the presence of alternative sites; damage to roads; disturbance; long term

economic impact due to imbalances created within the local labour market; the impact upon fisheries; and finally, amenity considerations.

During the Inquiry it became known that the final contract for the station had already been awarded before the Inquiry had even opened. This caused a furore that found its way to the House of Commons where it was described as ‘the worst mistake’ and gave the “*impression that the Authority was ready to ride roughshod over the rights of the individual*” (HCD 569:107).

Thus there was a feeling among objectors that the outcome of the inquiry was a fore-gone conclusion (Welsh 2000: 86). This feeling was intensified when the SSEB physically trespassed upon the estate to conduct preliminary site evaluation. This stirred up a ‘great deal of ill feeling’ and the inspector commented that “*Excess zeal does not atone for trespass*” (HMSO 1957: 12). Thus the Hunterston Inquiry raised the issue, made with much effect in the mid 1970s by Flood and Grove-White (1976), that the development of nuclear power represented a threat to individual liberty and human rights.

### 2.2.3 Trawsfynydd.

The second round of sites selected for Magnox stations by the CEA were located in areas where MPs and councilors welcomed the developments and the prospect of local opposition was minimized. However the selection of Trawsfynydd in the recently created Snowdonia National Park generated controversy. The locals were strongly in favour on employment grounds, whilst national conservation groups, which included the Ramblers Association, the Youth Hostel Association and most importantly the National Parks Commission, were opposed on ‘amenity’ grounds.

This involved not only dispute over the aesthetics - the modernist architecture of the station - but also its location in an area of outstanding natural beauty. The building of large industrial plants in rural areas was considered as a threat to England’s ‘green and pleasant land’ and found expression in the House of Lords, the press and at the inquiry. The tendency for the press and inquiry inspectors to focus on ‘amenity’ issues within early inquiries reflected the fact that ‘amenity’ was a familiar category of dissent, and according to Welsh “*In the prevailing discourses of the day ‘amenity’ had a similar connotation to NIMBY in more recent times*” (Welsh 2000: 70).

A 3 day inquiry was held from 12-14th February 1958 (HMSO 1958), with daily reports in The Times. The opening of the Inquiry, according to Sir Stanley Brown, the Chairman of the CEA, “*attracted a demonstration march of supporters, complete with banners... We were duly grateful*” (Brown 1970: 5). Delay in announcing the result caused local restlessness with The



Times reporting on 6 June 1958 that local people showed eagerness to attract the project with them calling for ‘bread before beauty’.

The Times in its editorial (6 June 1958) said:

*“The NFU branch complained that the National Parks Commission was retarding progressive development in the country generally, which was having a depressing effect on agriculture and economic development”*. Furthermore it gave the opinion that *“The government was withholding permission for a decent interval to placate the amenity interests, whose arguments and interventions must be recognized as stemming from the most worthy motives”*.

#### 2.2.4 Dungeness

The argument that economic development should take precedence over amenity and wildlife issues had few critics in the late 1950s. One person who was prepared to take a stand was Max Nicholson, the Director General of Nature Conservancy, an organization set up by the Government in 1949 to protect wildlife sites.

The proposal to build a Magnox station at the site of the Dungeness nature reserve bought an uncompromising and explicitly 'environmental' response from him. <sup>9</sup> At a press conference on 8 December 1958, the week before the Inquiry was to open, Nicholson said he would oppose absolutely Dungeness power station at the Inquiry. He said we must *“avoid the sacrifice for all time of by far the most important shingle structure in the British Isles and probably in Europe”* (Times 1958a). The Conservancy in its evidence to the Inquiry wrote that the land in question *“is of unique and irreplaceable permanent importance to science, while the project for which compulsory powers are proposed to be exercised is of relatively short term utility”* (Nature Conservancy 1958: 4). Furthermore in an attack on nuclear siting policy it declared that *“The long term national economic interests which the programme of nuclear power development is designed to serve, are inconsistent with the selection of a site so far from the point of consumption”* (Nature Conservancy 1958: 17). Thus it asked the Inspector not to recommend the scheme.

At the Inquiry, which lasted 3 days from 16 to 18th December 1958 (HMSO 1959), counsel for CEGB, Mr. S. Cooke, made a strong attack on the Nature Conservancy. He said that their book (of evidence) about the proposed Dungeness station was ‘intellectual opportunism’, was full of exaggerated language and false suggestions, and was a lamentable performance by a public authority. Cooke stated *“At best the book was obscure, and at worst it was an equivocal, evasive and disingenuous. The arguments were irresponsible. ...How it justifies this ill-advised and ill-informed incursion into matters which are quite outside its functions is difficult to understand but it is disturbing to see”* (Times 1958b).

A CEGB witness, D. Clarke, the Chief Planning Engineer, put forward the contemporary view that the amount of damage done to minority interests would be relatively small by comparison with most sites that could be found. Two days later, in his evidence to the Inquiry, Nicholson replied to his critics and said *“everybody connected with the inquiry as having a “split personality” what was being discussed was a collision between the two personalities - we wanted economic development and a higher standard of living but we also wanted to leave something of our inheritance to our children”* (Times 1958c).

However his evidence was seen more in scientific terms rather than ecologically ethical terms, and Dungeness was presented as a conflict between scientific research and economic development. After the station was approved in June 1959, Francis Rose, Chairman of the Kent Naturalist Trust, wrote to The Times expressing his shock at the decision, saying that the site was unique in Europe and of great scientific value. He wrote (The Times 15 July 1959):

*“The irony of the situation is that in the name of the advance of science, the Authority is destroying an area which is far more valuable as a site for scientific study than as a site for a power station. The power station could go elsewhere but we cannot move the unique structure of Dungeness nor its wild life”.*

The result of the decision was that the Nature Conservancy abandoned its proposed Dungeness National Nature Reserve. It said *“A clear choice had to be made between on the one hand the conservation of the unique national interest of Dungeness for scientific research and education and on the other the exploitation as an engineering site”* (The Times, 24 November 1959).

Other naturalist bodies expressed their disappointment. The Council for Nature (The Times, 14 July 1959), said that this tract of shingle was preserved through naturalists efforts to maintain its wild character in perpetuity as a national asset. They suggested a review of nuclear siting policy, with the construction of nuclear stations nearer to built up areas. This they hoped would protect remaining undeveloped coastal area. This echoed arguments put forward at the Inquiry that if nuclear stations are safe why build them in isolated spots? Ironically when the Government did decide to change its siting policy in February 1968, and allow AGRs to be built much nearer to built up areas than previously, one result was the support of the Nature Conservancy but strong opposition from local residents. This is what occurred at Stourport-on-Severn in early 1970 (see Section 2.4).

### **2.3 The NUM anti-nuclear campaign in the 1960s**

This section looks at the anti-nuclear campaign waged by Alf Robens and Fritz Schumacher, at the National Coal Board, in the 1960s. For Robens it was a vested interest campaign to protect miners' jobs, but for Schumacher it was about ethical and conservation issues. Their campaign



ended in defeat in 1968. The appointment of Alf Robens as Chairman of the National Coal Board (NCB) in 1960 heralded the start of the first national campaign against nuclear power in Britain. As Robens wrote in his autobiography *"The battle of nuclear power versus coal began as far as I was concerned in October 1960, the month that I took up my post as Chairman Designate of the Coal Board"* (Robens 1972: 179). His ten year campaign, during his tenure at the NCB, was ably assisted by Fritz Schumacher<sup>10</sup>, the Chief Economist of the NCB.

Schumacher's eldest daughter and biographer, Barbara Wood, wrote *"Robens was not the sort of man to preside over a declining industry. He understood at once it was important to keep the coal industry going and used Fritz to feed him with all the arguments he needed in the battle to keep the industry not only alive but also thriving. Robens did the fighting, Fritz supplied the ammunition"* (Wood 1984: 301). As Barbara Wood pointed out: (Wood 1984: 302):

*"The arguments with which Fritz furnished Robens, and which he himself put forward endlessly in lectures and articles, were basically the same as those he had put forward in the 1950s, only stronger. He pointed out the finite nature of the non-renewable energy resources, and the foolishness of abandoning one major source just because one happened to be cheaper in the short term".*

Robens was not anti-nuclear per se, and his campaign can be seen as a vested interest one. He remarked *"Neither the Coal Board as a whole nor I personally were against the building of nuclear power stations... Our criticism was that the programme was too big for a new process, and that before proceeding to a large (and, as it turned out) disastrous programme operating experience should first be gained"* (Robens 1972: 181). He wished to protect the coal industry from a too rapid shut down, and argued vociferously that nuclear power was being unfairly subsidized. Schumacher, in contrast, was against any nuclear power. Wood wrote of the NCB members (1984: 303):

*"To Fritz their faith in nuclear energy horrified him more than anything. He had been collecting statistics about nuclear energy since his joining the industry... There was no question in his mind that the impact it would have on the supply of energy in the 1960s, 1970s and 1980s would be negligible. Not only was it the wrong kind of energy, contributing only to baseload electricity needs, but in percentage terms of total energy needs, its contribution was insignificant...To replace coal by nuclear energy just did not make economic sense"*

### **2.3.1 The Hartlepool Crisis**

Robens' campaign to protect the coal industry and to expose the subsidies given to nuclear power, had the backing of many Labour MPs, especially those from mining constituencies.



However the Labour Government, under Harold Wilson, was very pro nuclear and the established view was that the coal industry had no future and should be run down. The Labour party, in opposition in the early 1960s had promised support for coal, but in government, from 1964-70, reneged on their promises and accelerated the coal industry shutdown.

The campaign reached a climax in 1967-68 with the run up to the 1967 White Paper on Fuel Policy, and the decision on the proposed AGR nuclear power station at Seaton Carew, near Hartlepool, south of Newcastle. Robens realized that if this station was built, on the very edge of the Durham coalfield, then the coal industry had a bleak future as a supplier of coal to the electricity industry. Williams agreed writing *“if coal could not compete successfully with nuclear energy there, then its future was bleak indeed. The psychological stake for the mining community was thus enormous”* (Williams 1980: 165). Feelings amongst miners ran high, as Robens remarked *“Even to suggest putting a nuclear power station on the coalfield was regarded by the miners as the kiss of death and an act of treachery on the part of the Labour Government”* (Robens 1972:194).

Robens, along with the 1967 Select Committee on Science and Technology, repeatedly called for an independent financial investigation of the economics of nuclear power (Williams 1980: 166-8). He did not believe CEGB claims that nuclear was cheaper than coal. He complained bitterly about nuclear secrecy on costs *“This conspiracy of silence is a sinister development. Parliament is being denied information of the greatest national importance - information that is essential for seeing whether the vast sums of money being invested by a nationalised industry are being wisely spent”* (Robens 1972: 184). Robens justified his campaign: *“I had already been criticised in many quarters for presuming to question the economics of the AGR question. My justification was the half a million people on the coal industry's payroll”*.

However the Government had been persuaded, by a 1964 review, that nuclear power in the form of the AGR was the power station of the future. The result, however, was a foregone conclusion: the media and many MPs, such as Tony Benn, were solidly pro-nuclear and there were then few anti-nuclear critics in Britain. One critic was Duncan Burn who in his 1967 book savaged the AGR and Britain's nuclear policy stating (Burn 1967: 108):

*“The policy of having a large programme of power stations, originally planned to cost £1,000 Million by 1965, was a badly judged use of resources, which was not imposed by what was wrongly called the 'energy gap'. The UK Government's central guidance and control led to a use of lavish resources wastefully”*.

However leaders of both main parties in Parliament joined in expressing disapproval of Burn's book. Tony Benn, then Minister of Technology, concluded Burn's analysis was 'polemical' and

the picture it presented was 'false' (Burn 1978:14). Benn expressed his *“belief that this country had been given good value for the money it has spent in the field of civil nuclear power”* and he thought *“the position will be seen more clearly in our favour in a few years' time”* (Burn 1978:14).

#### 2.3.1.1 Schumacher's 1967 Speech

In such a pro-nuclear climate, Schumacher's speech on 19 October 1967, giving the annual Des Voeux Memorial Lecture on 'Clean air and Future Energy - Economics and Conservation' to the National Society for Clean Air Conference, at Blackpool, to 900 delegates caused a storm (Schumacher 1967a). In it he raised doubts about the safety of nuclear reactors, drawing attention to the problem of the radioactive wastes and arguing for watchfulness on the effects of this new technology. Williams commented (1980: 160):

*“Schumacher also offered what was for its time a very unorthodox opinion, to the effect that nuclear stations represented an incredible, incomparable, and unique hazard to human life: worse still, this did not enter any calculations and was never mentioned”.*

Schumacher's remarks were widely reported in the press with a headline of “Nuclear stations 'hazard to life' ” in The Times the next day. A statement from the Ministry of Power dismissed his remarks as *“so inaccurate that they cannot be regarded as a serious contribution to any discussion of the subject. This may be explained by his having no scientific qualifications in the nuclear field”* (Times 1967). The Ministry defended the nuclear safety record by saying: *“His suggestions that safety considerations have been disregarded in the development of nuclear power is totally unfounded. Public safety issues are and always have been of the greatest concern to the Government”.*

Peter Williamson, a GEGB delegate at the conference, linked Schumacher's speech to the campaign run by the NCB in favour of coal and against nuclear power, saying (Times 1967):

*“For Dr Schumacher to suggest that there is a conspiracy of silence to prevent the public from learning of the health and safety aspects of nuclear power suggest to me that he is more remote from the subject than his paper might imply. It is ironic that this attack on the safety of nuclear power should come from a senior official of the National Coal Board, although maybe it is just part of the anti-nuclear campaign that you may have noticed in the past few months”.*

Richard Marsh, the Minister of Power, rebuked Schumacher saying that his lecture *“was one of the most extraordinary and least profitable contributions to the current debate on nuclear and coal cost”* (The Daily Telegraph 21 October 1967). Schumacher defended himself a week later



in letter to The Times on 25 October, but then received no more publicity until the launch of his book in 1973.

### **2.3.1.2 Defeat**

Robens realized, with the publication of the 1967 White Paper (which gave an enhanced role to nuclear and reduced one to coal) together with the approval given to the Hartlepool nuclear station in 1968, that the coal industry had suffered a serious defeat. He wrote *“The effect on the industry's morale was shattering everywhere... there was no concealing the fact this was a devastating reverse”* (Robens 1972: 199). His anti-nuclear campaign had been in vain. Both he and Schumacher left the NCB in 1971, and in neither of their biographies is there any mention of nuclear power after 1968. Robens concluded *“It saddens me to think that the country suffered because the advice I and my colleagues (notably Schumacher) gave was ignored by the civil servants and the politicians. We were regarded as bloody nuisances at the time”* (Robens 1972: 226).

Schumacher felt more bitter, as Barbara Wood commented (1984: 301):

*“The Labour government believed in cheap oil and in high technology nuclear energy... Wilson's Government, blinded by the benefits of short term, cheap energy, turned their back on the people; blinded by the seductions of high technology they put their money into nuclear powered stations and forced the pace of pit closures to accelerate. Life under Labour was far worse for the industry than under the Tories. Fritz felt disgusted and betrayed”.*

Schumacher was, however, to continue his opposition to nuclear power particularly after the publication of his best seller *Small is Beautiful*, in 1973, where his 1967 speech is reprinted in a chapter with the provocative title ‘Nuclear Energy - Salvation or Damnation’ (for further discussion of Schumacher's ethical views on nuclear power see section 6.4.1).

## **2.4 Stourport**

The Government decided in February 1968 to change its siting policy to allow the construction of nuclear power stations in more built up areas than previously (see Openshaw 1986: 131-8). This may have pleased conservation groups, like the Nature Conservancy, but the result was to increase opposition to nuclear power stations amongst the proposed host communities.

Although there was an uncontroversial acceptance at Heysham in 1969, a proposed station at Stourport (near Kidderminster) was withdrawn before an inquiry after strong local opposition in 1970. There were two public inquiries in 1971 - the first for a decade - over the proposals to build AGRs at Connah's Quay (near Chester) and at Portskewett (near Chepstow). The first lasted 28 days, between 9th March to 6 May, and the inspector, for the first and only time at a

public inquiry into nuclear power, refused consent (Rudig 1990: 118; DTI 1971a). The second in June lasted only 3 days; approval was granted but the station was never built.

The campaign against the Stourport nuclear power station in early 1970 illustrates many of the perennial themes of the British nuclear debate. Nuclear utopianism by its supporters, arrogance and dismissal of fears by the CEGB, a backlash against hype and the suppression of debate, the founding of a campaign by marginal political elements, lack of support from established conservation groups, and the strength of fears about the hazards of radiation. It was utterly a local campaign, with no national media or conservation group interest or support.

#### 2.4.1 National Press coverage

The national press only covered the beginning and the end of this event, and attempted to provide some explanation. The proposals for two AGRs to be built next to two existing coal stations at Stourport-on-Severn, in Worcestershire, was announced in The Times on 20 January 1970. There was no further national publicity until 9 months later, a few days before the decision was announced to withdraw the proposal on 22 October 1970.

A report in The Times on October 19th stated that there had been many objections to the proposal, including those from Worcestershire County Council, the Worcestershire branch of CPRE, the Severn River authority and the citizens of Worcestershire, who had signed petitions (Times 1970). The Times seemed confused as to whether this opposition was more against pylons than the power station by saying “*rural conservationists have recently been saying that power stations... are often less of a threat to the countryside than the big pylons which connect them to the national grid*” (Times 1970). However it admitted that there was opposition to the power station by saying “*The countryside lobby has also been displaying scepticism to the generating boards stock answer on ‘thermal pollution’*” (Times 1970).

However five days later The Times (24 October 70), reporting on the Government’s decision to refuse consent, now remarked that this decision “*is seen as an important environmental victory*”. In face of a virtually united front from the whole spectrum of local government in the region it said the proposal ‘never got off the drawing board’. The Guardian, on the same day, reported that rejection had been based ‘mainly on grounds of safety’. Another factor in the proposal’s defeat was that Peter Walker, the newly appointed Environment Minister and MP in an adjoining constituency, opposed the scheme. The official grounds for refusing consent were that the site did not meet the Government criteria (of February 1968) for building AGRs close to urban areas.

Welsh attributes the withdraw of the Stourport application to the Government’s fear of a public inquiry “*where the government’s siting policy would have been subject to expert challenge*”



(Welsh 2000: 138). Given the absence of any detailed technical report to legitimate the near urban siting policy an extensive cross-examination would have been potentially embarrassing and damaging, and Welsh argues that *“To have allowed the Stourport application to proceed to the inquiry stage would have been to run the risk of placing expert dissent over the effects of low-level radiation and safety of the AGR firmly in the public eye”* (Welsh 2000: 138).

#### 2.4.2 Local Opposition

The proposal for the Stourport nuclear power station sparked much local press coverage and debate. The two local papers, Kidderminster Times & Stourport News (KT&SN) and The Kidderminster Shuttle (KS), naturally gave the proposal headline status, and their letters column was the outlet for an emerging opposition.

The proposal was greeted with enthusiasm, with the KS, (23 January 1970: 1) carrying the headline ‘Stourport a ‘Boom’ Town’ and quoting Cllr. Stanley Jones, the chairman of local planning committee, as saying *“everyone will get very prosperous from the £100 m station”*. This would be because several thousand workers would be employed, and the station would double the ratable value of Stourport. He dismissed any possibility of dangers, saying that it was obvious the Government would not allow it to be built if it was unsafe. Stourport Council, he said, was unanimously in favour; in fact it had encouraged the CEGB to build it, having been in negotiation with them for several years. The article noted that this would be the first nuclear power station to be built inland, also the first within an urban area. After this euphoric support from a leading local politician it is intriguing to see, a week after the proposal was announced, that the other local paper, the KT&SN (30 January 1970: 12), had the headline on its editorial column entitled ‘Nuclear Power Station opposition expected’. The author commented prophetically or invitingly that:

*“one can expect the opponents to the scheme to show their hands, in fact there are already indications that some residents of the town are far from keen on the idea... although there has been some talk of Stourport becoming a “boom” town, many people will need more convincing proof that the erection of the £100,000,000 plus nuclear station will indeed bring greater benefits to the majority of the inhabitants”*.

The column then went on to discuss fear of modernization of the nearby town of Bewdley from a proposed bypass and that its supporters were now have doubts. It quoted the views of David Edwards, a local craftsman (KT&SN 30 January 1970: 12):

*“Why is it that so many people today are striving for something worthwhile to look at - such as representational painting or a Tudor half-timbered cottage?... Because such things*



*were made with the hands, hearts and mind of folk who cared enough for the beauty and above all, the pride of their great English craftsmanship”.*

.Furthermore Edwards said that “*we are bowing down to the march of the planners and so Big Brother who likes to use their flag of progress as an excuse to hide behind, while they destroy our countryside further*” (KT&SN 30 January 1970: 12). Whether the author of this column intended to link (expected) opposition to the Stourport nuclear power station with the fear of modernization existing in a small rural town is unclear. But doubting questions and criticism were soon forthcoming in the letters column of both papers. In the KS of 6 February, James Millington wrote posing questions, while on the 13th a Prof. Bono Publico<sup>11</sup> wrote supporting Millington’s doubts. Interestingly Publico raises the issue of nuclear safety, mentioning the Windscale accident of 1957, and stressing the need to study the effects of radiation emissions. Similarly, in the KT&SN, for the first 3 weeks of February, there were 9 letters printed, only one in favour of the proposed power station. To counter this adverse comment Cllr Stanley Jones, chairman of the local planning committee, accused his critics of being accused ‘stirrer-uppers’, in an article entitled ‘Nuclear Power will bring better life for Millions’ (KS 20.2.1970: 11). In it he spoke of the need for more electricity in the West Midlands due to economic growth, and the threat of power shortages if the station was not built. His nuclear euphoria was not shared by all his fellow councillors. In the same issue Cllr Betty Gazard, in a letter, made an appeal to people to write in to the Ministry of Technology and object to the proposed station, and she said petitions were being organized.

### **2.4.3 CEGB arrogance**

At the end of February the CEGB tried to win over support with a four day exhibition with experts available to answer questions. The KS (27 February 1970: 1) with the headline ‘Nuclear Power: The Big Choice’, reported on this exhibition. It also mentioned that Cllr Betty Gazard, one of the few Stourport councillors against, was with her husband, Cyril collecting signatures for a mammoth protest petition be lodged by 14 March at the Ministry of Technology. The article said that the CEGB were dismissing fears of radioactive dangers, and very interesting for 1970 made the claim that it was not a bureaucratic juggernaut. It was quoted as saying “*we are not a huge powerful, unapproachable authority trampling down all before us in pursuit of some selfish purpose of our own*” (KS 27 February 1970:1). Thus the CEGB, even in 1970, was acutely aware of its image and unpopularity, and its reputation for arrogance. However its refusal to acknowledge resident’s fears on nuclear safety and the dangers of radioactivity, made it impossible for it to shake off its reputation as an unresponsive and aloof organization. Further its inability to provide a convincing answer to the frequently asked question (dating back at least



to the first nuclear Inquiry at Bradwell in 1956) of why, if nuclear power stations were so safe, were they built in remote areas? And why were there such detailed emergency measures in the event of any release of radioactivity? The change in siting policy in February 1968 to allow stations to be built in built-up areas, was accompanied by detailed arrangements for the emergency evacuation of all residents within a radius of about 2/3 mile of the nuclear reactors, together with curbs on housing development within a radius 2 miles.<sup>12</sup> It was these emergency measures which provided the rationale for Worcestershire County Council opposition.

#### **2.4.4 Opposition mounts**

In the KS, of 6 March 1970, the headline story was 'Nuclear Power Station: County Probe'. This reported that a county sub-committee (of the Planning Committee) was to look into whole matter, particularly the question of radioactive hazards both in the air and into the water discharged into the River Severn. Their report published in late April led to headlines in the KT&SN (24 April 1970) of 'Hundred evacuated if emergency occurs' and gave support to opposition concerns about radioactive safety. This County action was perhaps in response to increasing local opposition for in late March the KS (27 March 1970), in its front page story, '1,700 Sign N-Protest', reported that Cyril Gazard had sent a petition bearing 1,700 names to the Ministry of Technology. The KS reported that this petition had a list of 10 objections to the proposed nuclear power station, and it remarked on the wide area from which signatures had been collected.

The first calls for a public inquiry came in mid March. In a front page story, 'Nuclear Power "An Inquiry is Essential" ' the KS reported (13 March 1970:1) that the County Council had lodged a formal objection, and that Norman James, a local councillor, said that a public inquiry was "absolutely essential". The nuclear power station proposal was causing splits in the Stourport Council. In a letter to the KS of 20 March, Cllr. A. Hall, complained about Cllr. Stanley Jones, the chairman of local planning committee "*attempting to steamroller this matter through and using dictatorial methods to silence anyone who opposes him*". Hall further undermined Jones' assertions that Stourport could become a boomtown by saying that this "*cannot be substantiated by the facts*" and in fact fewer people would be employed in the new nuclear station than at the current coal-fired station (KS 20 March 1970). He again made this complaint at a public meeting in June by saying about Cllr. Jones "*He has consistently done his best in the past to stop questions being asked in the Council chamber*" (KT&SN 5 June 1970: 10).

By the beginning of April, the KS headline (3 April 1970) was 'Second Thoughts? Opposition to N-Plant Mounts at Stourport'. The report said that a powerful group of councillors may



persuade Stourport council to change its mind,. The recent Maud-Ratcliffe report on local government financial reforms, meant that the town would now not be able to keep the rate revenue from the nuclear station. It also mentioned that Mrs. Gazard now had over 2,000 signatories on her petition (the final count by late April was 2,200). Local MPs were now coming out against the proposal. Peter Walker, a neighbouring MP, was reported as having joined ‘the fight’ against the power station, while the local MP, Sir Tatton Brinton, had demanded a full public inquiry so that objections could be heard. He asked why if the nuclear station is completely safe were there restrictions on the number of people who can live within a two mile radius?

#### **2.4.5 County Council report**

The most powerful blow against the proposal was the publication of the report by the Planning Committee of Worcestershire County Council in late April. In it the Committee recommended that at the next County Council meeting on 4 May, the Council lodge an official objection and demand a public inquiry into the proposal. This they duly did (see KS 6 May 1970: 1). The committee report made headline news in both local papers. The KT&SN (24 April 1970) had the headline ‘Hundred evacuated if emergency occurs’ while the KS more soberly had ‘7 point objection to Nuclear Station’.

The seven points of objection as reported in the papers were:

1. The proposal would restrict future residential development (due to emergency arrangements).
2. Visual impact of power station with its massive cooling towers.
3. Impact on river flows due to massive need for cooling water.
4. A degree of risk posed to nearby residential areas.
5. Loss of amenity and lower house values to those living near the power station.
6. Burden of maintaining emergency arrangements.
7. Stourport was already too crowded.

Minutes of the County Planning Committee reveal that it was the restrictions imposed by the emergency arrangements that was the deciding factor. The minutes of special sub-committee of 3rd April state (WCC 1970: 74):

*“...in the light of restrictions upon development... we recommend the Committee to oppose the proposal on general planning grounds because of the restrictions which would result upon housing development in Stourport... We also suggest that the Committee consider an amenity objection based on the massive structural dominance of the proposed reactor and turbine house buildings together with the cooling towers”.*

#### 2.4.5.1 Radiation dangers.

The recommendations of the special sub-committee were duly accepted by the Planning committee held on 22 April and they also identified other concerns including danger to health from radiation. The Sub-Committee had written for advice to number of organizations, both in this country and abroad. They decided to ask Profs. D. C Leslie and J. Shaw, of Queen Mary College, University of London, to give an independent evaluation of the CEGB proposal. Their report was reviewed by P. W. Spiers of the University of Leeds, with gave particular emphasis to their views on the views of Gofman and Tamplin.

Leslie and Shaw (1970) produced a 3 volume report which gives an interesting view of expert opinion on nuclear power in 1970. Broadly they were in favour, with some technical reservations, and they much preferred nuclear to coal stations. They state (Leslie and Shaw 1970, Volume 1: 4):

*“Provided that the Council is satisfied about the safety aspects, the AGR would appear to be preferable in every way to the coal-fired station. Chief advantages of nuclear station:*

- 1. It is smaller*
- 2. There is no coal dump*
- 3. There is no chimney of any size.*
- 4. No combustion products are discharges*
- 5. One construction has been completed, the traffic to and from the nuclear station will be very much less.*

*It is interesting to note that there is a discharge of radioactivity from a coal-fired station: depending on the type of coal used, this can be comparable to the discharge from a nuclear station. When considering the potential health hazards of a nuclear power station, it should be remembered that the discharge of combustion products from a coal fired station represent an actual and unavoidable health hazard”.*

In their recommendations they state (Leslie and Shaw 1970: Volume 3: 1):

*“We consider that, provided there are no overriding objections to it, the proposal to site an AGR power station at Stourport is in the national interest. The demand for electricity is increasing, and we must hope that the rate of growth of demand will increase as the economy recovers... we feel that, provided the Council is satisfied about the radiation safety aspects of the proposal, a nuclear station is much to be preferred to one fired by a conventional fuel such as coal”.*

They consider three possible objections (Volume 3:1):

1. Effects of steam plume.



2. Excessive demands on, and damage to, the river.
3. Radioactive hazards.

In their discussion of radioactive hazards they discuss the consequences of a possible reduction in radiation doses to the general public. They mention the work of Gofman and Tamplin in the US on the need for a reduction in permitted doses. They state (p.4):

*“Gofman & Tamplin are responsible people... and should not to be confused with Prof. Sternglass, who recently got a lot of publicity for his views that bomb tests had killed hundreds of thousands of children. Our colleagues are unanimous that the statistics will not bear the interpretations which Sternglass is trying to put on them”.*

They pose the question of what would the CEGB do if standards were tightened. Their report concluded by saying: (p.5)

*“While we think that the proposal is basically advantageous, we have a number of reservations about it. Those are mainly technical and we advise that the Council should attempt to settle them by negotiation ...before going to a Public Inquiry”.*

Professor Spiers was even more pro nuclear. In a letter to the County Health Department he wrote (Spiers 1970a):

- “1. The site is near a populated area as distinct from the sites so far used.*
- 2. This practice is almost certain to increase as more reactors are built in this small highly industrialized country. ...proposals for Stourport will have been very carefully drawn up by experts to ensure the radiation levels and effluent discharges are well within what are internationally accepted levels”.*

On the question of a possible accident, he wrote (Spiers 1970a):

*“...I believe Windscale-type accidents are unlikely or impossible with the present closed circuit type of reactor, but I imagine some kind of accidental escape is conceivable and I imagine the Council to be concerned about this, particularly in view of the recently renewed press and TV discussions on radiation dangers”.*<sup>13</sup>

Gofman and Tamplin assertions that the existing maximum permissible levels should be lowered was too much for Professor Spiers. In his brief review of the report by Leslie and Shaw, he stated that Gofman and Tamplin are combining the most pessimistic risk estimates of the ICRP (Spiers 1970b). Furthermore Spiers attacks their assertions that the ICRP levels should be reduced by a factor of 10 to a population dose level to 17 millirems by saying that it *“cannot be very compelling in the light of the variations in the natural dose level - the difference in the means for the population of Aberdeen and Anglesey already differ by twice this amount”* (Spiers

1970b: 3). Thus the 'nuclear experts' could find no grounds to oppose the CEGB proposal on radioactivity grounds, despite public fears.

#### 2.4.5.2 Nuclear siting policy

One of the key questions was whether the proposed nuclear station at Stourport would meet the Government's new policy on nuclear siting. A short report commissioned by the sub-committee from the consultants, Associated Nuclear Services reported *"It is doubtful whether the choice of site is a reasonable interpretation of the Government's policy statement of February 1968 in view of the intensive development close to the proposed site"* (ANS 1970).

Leslie and Shaw however were of the opinion (Volume 3: 3), which was stated in the Planning Committee minutes, that *"it is not feasible to oppose the new national policy to allow nuclear power stations to be sited much nearer to built-up areas than had been the practice before 1968"* (WCC 1970: 85). The Planning Committee then considered the question of *"whether the Stourport site is so near a built-up area that it presents an unacceptable hazard"*. The same minutes report that *"Dr. Gronow (an expert from the Ministry of Technology) told the Sub-Committee off the cuff that Stourport appeared to be well below Heysham (a comparable urban site in Lancashire, but not yet built and tested) as regards the elements of risk by inhalation"* (WCC 1970: 85).

#### 2.4.5.3 Risk versus benefit

It thus appears that the Committee did not have evidence to oppose the station either on siting grounds or risk grounds. Despite this W.J. Balderstone, the Chairman of the Planning Sub-Committee, wrote his own paper entitled *Engineering Aspects of a Nuclear Power Station at Stourport*. This was considered at the Planning meeting on 22nd April which stated that this paper *"was intended to show the many points at which leaks of radioactive material could occur"* (WCC 1970: 85). In a prophetic sentence, which was reprinted in the KT&NS of 24 April, he warned *"Human error, carelessness and lazy indifference are liable to occur in the management of any plant, however well designed, especially perhaps at night when the rest of the world is asleep"* (WCC 1970: 85).<sup>14</sup> Balderston further warned, with his remarks reprinted in the KT&NS on 24 April, (WCC 1970: 85):

*"Already insurance companies have notified householders in the immediate neighbourhood that nuclear risks are excluded. The emergency arrangements, however well presented, must be a source of anxiety and are likely to dampen the ready sale of houses. The fear of a much greater danger than really exists will prey upon the minds of many people".*



This issue of risk was at the heart of the debate on the proposed stations. Associated Nuclear Services commented (ANS 1970: 100):

*“Behind the Government policy statement there is a broader principle that in siting the nuclear power station there should be an appropriate balance between risk and benefit, and in this case it seems most unlikely that the additional benefits in the form of reduced costs will compensate for the additional risk to the local community”.*

The Planning Committee, seems to have adopted ANS view, for it stated (WCC 1970: 85):

*“...the Council as planning authority may well decide that the applicants should be put to the test to prove that the risk does not exist or is justified in the national interest by the counterbalancing gains. If so, a suitable wording for this ground of opposition might be:-  
“The proposed site so near to a built-up areas presents a degree of risk which has not yet been justified” ”.*

This demand that proof be provided that 'risk does not exist' was to become a central theme of anti-nuclear protesters in the 1970s. In contrast the argument that nuclear stations were 'justified in the national interest' became a major plank of Government's attempts to push forward their nuclear policy.

#### **2.4.6 Stourport: the end.**

With the publication of the Planning Committee's report in late April, and the proposal's negative portrayal in headline news in the local papers, the proposal was effectively dead. The local campaign nevertheless intensified. In early June there was the founding of the Anti-Powerport Station (APS) with a Committee composed of many councillors and with 60 members (KT&NS 5 June 1970: 10 and 13). At a public meeting organized by the APS the promoter of nuclear station, Cllr. S Jones, was heavily criticised by his fellow councillors. There were calls for a register of objectors, and 'militant anti-nuclear power station rallies'. There was further talk of raising money to employ a barrister to state their case at a public inquiry. Cllr. Eric Higgs, the secretary of the APS committee, was stated as saying *“We are objecting because we do not want this in Stourport. There will always be an element of fear, and we don't want to live with it”* (KT&NS 5 June 1970). This fear of radiation was a dominant theme. Cllr Betty Gazard, a prime mover behind the campaign, said *“None of us know how much we shall receive, or if we shall receive any or if it will do us any harm”* (KT&NS 5 June 1970).

Interestingly there are no further reports after this date in the KT&NS of the nuclear proposal or of the APS, only a few letters mainly about conflicts over the handling of this issue in the Stourport council. The official announcement in late October that the proposal was being

withdrawn was not mentioned. Thus it seems that from June onwards it was a dead issue to the local media.

## 2.5 Portskewett

The campaign at Stourport against their proposed AGR had a knock on effect at the next site proposed by the CEGB for an AGR. This was at Portskewett (located south of Chepstow on the River Severn estuary in then Monmouthshire) just 50 miles down river from Stourport. The concerns expressed and the associated public campaign at Stourport, together with the actions of the Worcestershire County Council (WCC), were common knowledge in Portskewett (Welsh 2000: 138). Whilst Monmouth County Council (MCC) and the Rural District Councils supported the application, Portskewett Parish Council strongly opposed it. The reports prepared for WCC had been studied, and the council “*regretted the absence of any such professional approach*” by MCC (quoted in Welsh 2000:138). According to the public inquiry transcripts the County Council were accused of having delivered the whole project to the CEGB ‘on a platter’, and the public of Portskewett had ‘lost all confidence’ in their elected county officials because of “*their excessive enthusiasm... in projecting the merits of nuclear power*” and their ‘subservience’ to the CEGB (DTI 1971b:32).

The concerns of Sternglass, Gofman, and Tamplin over low level radiation were raised once more, and Portskewett Parish Council urged that Sternglass’ work be checked by the UK government. Particularly concerned about exposure to radiation were the local women’s group, the Portskewett Young Wives (Rudig 1990: 119). The CEGB however portrayed these concerns as the product of press reports (such as on Sternglass that appeared in The Observer on 16 May 1971) of discredited scientific work, relating to a different type of reactor, the American LWR rather than the proposed AGR.

Despite these public concerns over radiation dangers, they found ‘limited reflection’ at the Portskewett public inquiry (Welsh 2000: 139). The main concern of Government and the CEGB was over challenges to its urban siting policy which lacked any (published) technical basis. However their position at the Portskewett Inquiry was strengthened by the precedent of the granting of a site licence at Heysham in 1969, where the policy had gone unchallenged. As Welsh remarked on Heysham “*An application which had never been subject to scrutiny was thus used to legitimate those which were to be contested*” (2000: 139).

The Portskewett public inquiry lasted just three days in June 1971, and the application was approved but the CEGB never built an AGR there - most probably because by the early 1970s it became aware of serious design defects with the AGR (Williams 1980: 204-5).<sup>15</sup>



Overall, as Rudig remarked, local opposition before 1975 was on the whole rather weak with most objections having a clear 'NIMBY' or 'vested interest' rationale (Rudig 1990: 119). The next chapter examines the widening of opposition beyond these two concerns, due to the emergence of a broader based national network of environmental organizations.

### **3. The building of the UK anti-nuclear power movement in the 1970s**

This chapter examines the building of a national network of organizations opposed to the expansion of nuclear power, and in particular to those groups involved in opposing the THORP project at Windscale. Protest was initially small and scattered, but under the leadership first of the Conservation society (ConSoc) then of Friends of the Earth (FoE), it attracted increasing support from a wide range of groups. In the early 1970s protest may have been inspired by the continual drip of articles on the dangers of low level radiation in the national press. For instance The Times, gave front page coverage in January 1970 to the allegations of Sternglass (Wright 1970a), then there was a favourable review of Curtis and Hogan's book (Herbert 1970), and anti-nuclear letters to the paper. One such letter was by I. M. McNall (on 14 September 1971) where he outlined the conservationist case on energy (similar to that made by Schumacher in the 1960s) which would be adopted wholesale by latter environmentalists. He wrote that it was "*time to stop burning up limited stocks of fossil fuels, to stop producing ever-increasing quantities of nuclear wastes, and to invest in the two sources of energy which are nearly perpetual, clean and free, - sunlight and the force of the tides*" (McNall 1970).

This criticism in the early 1970s however resulted in little action, mainly because there was no national group willing to promote the anti-nuclear power message. Interestingly Peter Bunyard claimed that "*one of the first anti-nuclear demonstrations in Britain*" was organized by foreigners and that it (Bunyard 1981:181):

*"...took place on Easter Monday in London in 1970, and could muster only a handful of people of whom nearly all were foreigners. The demonstration then merged with the thousands of CND marchers... Many of the CND marchers were surprised at the demonstration against nuclear reactors; they did not consider the connection between reactors and the production of weapons-grade plutonium to be an important issue".*

#### **3.1 Nuclear power in the eco-press**

This demonstration and press coverage of the dangers of radiation from nuclear waste, may have inspired environmental writers, for in mid 1970 there were three articles published critical of nuclear power, concentrating on the dangers of waste disposal. First in May John Davy (1970a) published an article 'Atomic Waste' in Span (the Journal of the Soil Association). <sup>16</sup> Then in June 1970 Walt Patterson published his first nuclear article entitled 'Odourless, Tasteless...and Dangerous: Hazards of Radioactive Waste' in Your Environment (Patterson 1970; see Lamb



1996: 41). Finally in the July (in the first) edition of The Ecologist Peter Bunyard (1970) published his article 'Is there a peaceful atom?'

Both Walt Patterson and Peter Bunyard were to go on to become prolific and well known writers on nuclear issues. Walter Patterson, then a commentator on UK environmental affairs for the US journal Environment, became editor of the UK journal Your Environment in 1971 and in 1972 (after its demise) joined FoE. Peter Bunyard subsequently joined the editorial board of The Ecologist, and regularly provided coverage and book reviews for that magazine of nuclear issues throughout the 1970s. He was the first writer in the UK eco-press to report on nuclear opposition in Europe- the protests at Fessenheim, in Germany on Easter Monday 1971 (Bunyard 1971b) - and on Scotland's energy and nuclear problems (Bunyard 1971a).

According to Welsh, the two journals, The Ecologist and Environment (from the US) were *"amongst those responsible for the introduction of detailed arguments about the implications of nuclear power in the UK... they provided extensive coverage of nuclear issues throughout the 1970s from a critical ecological perspective"* (Welsh 1988, Chpt 6-26).

Initially the eco-press concentrated their criticism on the American LWRs, the British AGR reactors overall receiving a relatively favourable press. For instance Patterson writing in 1972 praised the AGRs as 'more efficient' and 'more environmentally sound' (Patterson 1972b). However wider anti-nuclear arguments were steadily introduced (from the US), including the risks of low level radiation, the link between civil and military uses, and the dangers of nuclear terrorism. As Welsh commented *"The introduction of a wide range of issues other than reactor safety and the presence of embryonic campaigning groups combined to create a climate within which opposition was inevitable irrespective of reactor choice"* (Welsh 1988, Chpt 7-27).

Then on 13 December 1971 came a TV documentary, 'A Question of Survival' with its second part on radiation; a reviewer said that its message (echoing Tamplin) was that there was 'no safe dose' (Banks-Smith 1971). Pocock notes the importance of this programme, writing *"Well organised and well publicised opposition to plans for the expansion of nuclear power in Great Britain may be considered to date from the beginning of 1972 as a result of this broadcast and of similar coverage by other media"* (Pocock 1977: 227). By the end of 1972 Patterson noted with satisfaction that newspaper reports, television programmes and public discussions were *"at last beginning to take a more critical attitude towards nuclear power than has hitherto been the case in Britain"* (Patterson 1972b: 9).

However, unlike the US, France or Germany there was no mass anti-nuclear campaign. Partly this was because no new stations were being proposed, and partly that there was little public discussion of nuclear affairs. The old style conservationists and New Left socialists were



generally in favour of nuclear power, while most environmentalists were concerned with issues of global doom - the *Limits to Growth* and *Blueprint for Survival* debate. Few had thought about nuclear issues. As Williams observed “*Opposition to nuclear power had increased throughout the seventies in all the liberal democracies, drawing strength from a substantial measure of international co-ordination, but the movement in Britain remained distinctly muted until the Windscale issue in 1976-7*” (Williams 1980: 263).

Harold Bolter, BNFL’s Director of Information, places the start of the anti-nuclear campaign in 1976, saying that it took a highly critical (Flowers) report “*to give the campaign its early impetus and credibility*” (Bolter 1996:169). With that report the opposition had to be taken seriously as the “*Royal Commission’s views could not be shrugged off as the fevered ravings of people with vivid imaginations and suspect political motives - the nuclear industry’s customary response to opposition in those days*”. Patterson too agrees on the importance of the Flowers Report in “*confirming for the first time in semi-official terms that some of the main points raised by ‘environmentalists’ warranted genuine concern*” and that the political credibility of criticism of civilian nuclear power was immeasurably enhanced (Patterson 1979: 159).

### 3.2 ConSoc debate and early action

The anti-nuclear campaign in the 1970s can be considered to have started with the ConSoc debate over nuclear power following the reprint of a BBC Radio 3 talk by Jon Tinker (given on 27 June 1972) on the Stockholm Conference. The text published in Conservation News later that year, said that the Stockholm Conference had “*totally failed to come to grips with nuclear power... At the moment, only a handful of countries have atomic power stations. In less than thirty years’ time, half the world’s electricity will come from the atom. By then, two new 500 megawatt nuclear power plants... will be opening every day*” (Tinker 1972: 5). Tinker then described the problem of radioactive waste, he said there was no safe way of disposing of it, and that “*This devils broth can never be released, for it contains more radioactivity than a dozen H-bombs...What sort of environmental legacy is that for our children and grand-children?*” (Tinker 1972: 5). Tinker then warned “*The trouble is, by the time we find out if the long term waste problem is insoluble or not, thirty or so of the world’s leading nations are going to be hooked on nuclear power, unable to give it up without crippling their electricity supply*” (Tinker 1972: 5).

He remarked that at Stockholm the hazards of nuclear power was not on the UN agenda, and hence not discussed officially, but was discussed at many unofficial forums and conferences.<sup>17</sup> Professor Fremlin, who was active in ConSoc in promoting the nuclear cause, and gave talks to local branches, came to the defence of nuclear power in the Conservation News January 1973



newsletter.<sup>18</sup> He said that Tinker has made an “*absurd and incorrect statement that the “devils broth” contains more radioactivity than a dozen H-bombs*” (Fremlin 1973: 13). Fremlin pointed out that the burning of fossil fuels was causing the death of something in the region of 10,000 people a year, while the danger of nuclear power was hundreds to thousands times less than that of other more conventional methods of power production. In the April edition, John Davoll, the Director of ConSoc, said that Fremlin was being ‘mildly disingenuous’, and that “*not everyone shares Prof. Fremlin's optimism about the ability of humanity to manage vast amounts of nuclear wastes safely for millennia*” (Davoll 1973a: 5). Davoll’s lack of confidence in nuclear experts is apparent in his review of Patterson’s first book, *Nuclear Reactors*, where he said “*Nuclear power is only part of a even more intimidating nexus of problems related to the use and generation of energy... Can any society so dependent on the advice of experts... have any hope of arriving at informed and democratic decisions on the most vital questions that face it*” (Davoll 1973b).

Davoll in his review of ConSoc’s activities in 1974 again warned on the dangers of seeking reliance on increased energy supplies “*Even more seriously, the commitment to nuclear energy is gathering momentum, and may well soon become almost irreversible; the nuclear waste it will produce represents industrial society's ultimate gesture of indifference to the future*” (ConSoc 1974b: 8).

### 3.2.1 ConSoc Nuclear Policy

On 15 December 1973, ConSoc Council accepted an Energy Working Paper (by David Corry its Convenor) which expressed opposition to the building of any more nuclear power stations until an absolutely safe method of disposing of the long lived radioactive wastes had been perfected.<sup>19</sup> This was to lead to the start of ConSoc’s anti-nuclear campaign lead by Jane and John Pink, of the Merton Branch from December 1973. Soon afterwards, in early 1974, ConSoc Leaflet issue an 4 page leaflet *Nuclear Power: Salvation or Deathtrap?* which briefly explained the dangers of nuclear power and gave the Society’s views (ConSoc 1974a). As the ConSoc 1974 Annual Report stated “*It is hoped to use this widely in opposing further reliance on nuclear power, and particularly the implicit commitment to the plutonium-based fast breeder reactor*” (ConSoc 1975: 17).

Then at the ConSoc AGM, held on 16-17th November 1974, two anti-nuclear policy resolutions were passed. These stated (ConSoc 1975: 10):

“*1a) calls upon the British Government to halt the building of any more nuclear power stations while there is no absolutely safe method of disposing of long lived radioactive wastes 1b) urges that the Society... should launch and sustain a campaign to alert the*

*general public and to inform the Government about the dangers to life, born and unborn, created by nuclear technology and c) calls for an investigation into alternative sources of power”.*

The campaign continued assisted by the strong support of John Davoll, who stated, in his review for 1974-75, that much effort had gone into a campaign on nuclear power *“Most of this has been devoted to increasing public knowledge about the implications, principally because Jane and John Pink of our Merton Branch were willing to initiate and manage a substantial campaign”* (ConSoc 1975: 15). There was however much internal division within the Society over its anti-nuclear message, as is evident from the Letter Page of Conservation News during the next year. In the letter column Professor John Fremlin was the first to oppose the Pinks’ campaign and defend nuclear power (Fremlin 1975) but was rebutted by the Pinks in the next issue. Conservation News 59 (January 1976) had four letters on nuclear power: one defending by B. K. Jones but three opposing: by E. C. Durham, B. K. Jones and Beryl Kemp (1976a), the new Convenor of the Energy Working Party. Although ConSoc’s campaign was couched in technical language, about reactor choice, energy supply issues and risks of radioactive waste, it was, according to Beryl Kemp, at its heart about the moral issue of intergenerational equity (Kemp 1976a).

The debate in Conservation News on nuclear power was further enlivened by interviews in spring 1975 with two ‘establishment’ figures, Lords Avebury and Robens, who both supported its continuation. Lord Avebury, the Society’s President, was not in favour of the Society’s policy of abolishing nuclear power saying *“I must confess that I don’t go all the way with the Conservation Society in saying that we shouldn’t have a nuclear programme at all”* (CN 55).<sup>20</sup> He was in favour of a small programme of steam-generating heavy water reactors, as it was *“intrinsically a safer reactor than the American pressurized water reactor, because it cannot fail catastrophically”*. Lord Avebury believed that the main problem with the expansion of nuclear power was *“not the disposal or storage of the wastes but the risk of nuclear terrorism”*. Overall he believed that *“we should proceed with great caution and not expand our nuclear programme to the extent that we become unduly dependent on it”*. The policy should be *“of preserving a base from which the nuclear industry could expand in the future, if thought desirable”* (CN 55).<sup>21</sup>

In the next issue (CN 56), Lord Robens, the ex Chairman of the National Coal Board was in favour on nuclear power (despite his great opposition during the 1960s - see section 2.3) stating *“As far as nuclear power is concerned, of course we have to go ahead with this. There can be no argument about it”* (CN 56). Robens was aware of nuclear problems, particular



environmental and the threat of terrorism, but he believed that these could be solved by the international cooperation of scientists. He concluded that he did not believe *“that you put nuclear power on one side. You recognise that it has certain problems. You identify these problems with great clarity, then seek the solutions to them”* (CN 56). Despite this support for nuclear power from 'establishment' figures a few activists still pressed ahead with their campaign, largely ignored by Conservation News until the Windscale Inquiry two years later.

### 3.2.2 Anti-nuclear campaign

The ConSoc campaign against nuclear power was initially led by Jane and John Pink of the Merton Branch of ConSoc. They started their campaign with a short piece in Conservation News, the ConSoc newsletter, entitled 'Nuclear Power: the dangers from long lived radioactive wastes' in September 1974 (Pink and Pink 1974). In it they emphasized the dangers of long-lived radioactive wastes, and outlined their campaign to bring 'the facts' to public attention. There was also a two part feature by Peter Dickson; entitled 'Plutonium Nightmare' in the November 1974 and March 1975 issues on the possibilities of nuclear sabotage and terrorism (Dickson 1974).

The Pink's campaign consisted firstly of a 'letter of concern' to be signed by prominent people, and linked to this a petition to *“demonstrate to the Government that this is a matter of concern to many people”*. In the January 1975 newsletter they reported *“that there had been considerable support from Members and others outside the Society for the project to publicise these dangers”* (Pink and Pink 1975). They note the starting point of their campaign - the petition and the letter- was *“our Council's expressed opposition (December 1973) to the building of any more nuclear power stations”* with this opposition being fully supported in a resolution passed at the ConSoc AGM in November 1974 (Pink and Pink 1975). The 'letter of concern' appeared in The Guardian on 7 January 1975, with 43 signatories, including those of E. F. Schumacher, Bishop Hugh Montefiore, and Peter Hain (Bryce Smith et al 1975). A copy was sent to all MPs, and the Pinks hoped that *“If it got good publicity, it should give impetus to the local campaigns and we hope thereby attract more supporters for the petition”* (Pink and Pink 1975).

Two replies to the petition appeared in The Guardian on 13 January 1975, the first from Prof. G. N. Waltone and Dr M. I. Brown, of Imperial College, and the second, a long detailed rebuttal, from Dr. Franklin of BNFL. By coincidence the letters appeared in the same issue as reports of the deaths of two workers from Windscale, that could have been caused by exposure to low level radiation. The cause of their deaths was disputed by radiation experts, including Joseph Rotblat,

and lead to much media coverage including a TV documentary ‘An Awful Coincidence’ (Patterson 1975: 4).

### 3.2.3 Downing Street march

The next ConSoc action was delivery of the petition (as planned) to Downing Street on 22 March 1975. According to the 1975 Annual Report (ConSoc 1975: 10):

*“Petition forms were distributed to Friends of the Earth groups, Young Liberals and student environmental groups, as well as ConSoc members and branches, and a final total of 8906 signatures were obtained to the petition. On 22 March 1975, 90 people were present to march to the entrance of Downing Street; the petition was delivered to No 10 by Alison Pink and Irene Coates, accompanied by Professor Tom Kibble, Dr Kit Pedlar, Peter Hain and Diana Heeks”.*

The event was covered by TV and local radio, the national and local press; an oblique mention of this petition is made a few days later in The Observer which gives a full page story to the dangers of nuclear waste (Hawkes 1975a). However the march had minimal coverage in the environmental press and only a few lines appeared in Conservation News (No. 56: 21). This is not surprising as ConSoc’s campaign had attracted no attention from the environmental press; the first mention of its campaign was in Undercurrents (UC) No.10, just before the delivery of the petition to Downing Street (Undercurrents 1975c). <sup>22</sup> Nuclear issues had only received prominence in the previous issue (No.9) of Undercurrents in early 1975 which had 16 pages devoted to nuclear power, with the lead article entitled ‘Why the NUCLEAR POWER PROGRAMME MUST be STOPPED’. In an article entitled ‘Methinks we do protest too little’ Undercurrents bemoaned the lack of nuclear opposition in this country compared to others and remarked “*So how much longer will we in Britain go on swallowing our nuclear medicine without a murmur?*” (Undercurrents 1975b).

Furthermore at that time local branches of FoE had little interest in nuclear issues, so had little representation on the march. Undercurrents in Spring 1975 reported in a news piece entitled ‘Where have all the FOE’rs Gone?’ (Undercurrents 1975d):

*“The march to Downing Street on March 22nd... was supported by only 90 people, mostly from ConSoc. FOE’rs, though supposedly the more radical group, were thin on the ground. The Camden FOE Group, for example... elected to spend the morning shifting the tons of (now valueless) waste paper they had been diligently collecting. And they are supposed to be one of the most active and radical groups. A fine sense of priorities”.*

A meeting after the march to decide on future strategy ended inconclusively. UC reported that ConSoc and FOE agreed to go their separate ways, with the former preferring the



*“constitutional approach - letters to MPs, and so on”* (Undercurrents 1975d). ConSoc’s campaign and the Petition was taken over from the Pinks by Beryl Kemp, the new Convenor of ConSoc’s Energy Working Party. On the effectiveness of the Petition Jane Pink commented *“It is always difficult to assess the effects of this type of action, but there is no doubt that the DEN, MPs and others are now more ready to acknowledge that there are legitimate grounds for concern”* (Pink 1974). Following this Petition ConSoc was invited to give evidence to the Royal Commission on Environmental Protection (RCEP) on the hazards of nuclear power.<sup>23</sup> This was done at a meeting held on 11 April 1975, with Amory Lovins and Walt Patterson from FoE, and Fritz Schumacher and John Davoll being present. By late 1975 Beryl Kemp was becoming disillusioned with lack of progress with the ‘constitutional’ approach. She reported to ConSoc Council that she had spent most of 1975 in *“endeavouring to stop the nuclear power programme (with little result I fear) but it is intended to step up the pressure in 1976 in the form of non-violent resistance action, since other democratic methods seem to have failed”* (ConSoc 1976a:15). Her calls for ‘direct action’ while popular with some anti-nuclear campaigners would undoubtedly have been opposed by John Davoll, and also by FoE.

### 3.3 Early FoE Attitudes

As Tom Burke remarked in 1996 it is now forgotten that in the early 1970s FoE was predominantly in favour on nuclear power (Burke 1996). During 1970-71, the first two years of FoE existence they ‘broadly saw nuclear favourably’ but by 1973 *“we saw the ‘idiocy’ of nuclear, being influenced by Amory Lovins and Walt Patterson, who understood the technical arguments and convinced us.”* (Burke 1996). Their first opportunity to publicize FoE’s new found views on nuclear came at the 1973-74 hearings of the Select Committee on Science and Technology (known as the Science Committee) on nuclear power. As Williams remarked (1980: 262):

*“FoE’s principal initiative in 1974 was a memorandum of over 30 pages and with some 80 footnotes which two of its members, Amory Lovins and Walter Patterson, submitted to the Science Committee. Lovins was to become one of nuclear power’s chief international opponents, while Patterson was effectively to lead the British campaign for FoE”.*

FoE’s submission highlighted the safety concerns with the PWR, and drew on the extensive critiques done by the American anti-nuclear movement. They were able to exploit divisions in the UK nuclear establishment about whether to abandon British technology and go for the American PWR (as the CEGB wished), or press on with a new AEA design (the SGHWR)<sup>24</sup> and was welcomed by some sections of the business press (Pocock 1977: 227).<sup>25</sup> Thus FoE

established themselves over the period 1974-75 as 'reputable' nuclear critics and source of dissenting technical expertise. At first the principal lines of FoE's opposition were geopolitical and economic, not environment, with the early issue being over misuse of resources. As Burke remembers (1996):

*"The development of arguments over the period 1973-76 was first the accident risk of PWR, then rate and magnitude of building 40 GW of nuclear, then safety, then resources, then economics, then electricity generation, and finally soft energy paths. After the Flowers Report FoE added work on proliferation issues, and opposition to fuel cycle and then reprocessing".*

With the PWR no longer in the news there was little to campaign against, and FoE took no part in the debate over the SGHWR. The only public inquiry was in June 1974 over a proposed station at Torness in Scotland, at which Patterson gave evidence against, to little avail and publicity (see Lamb 1996: 83).

### 3.3.1 Lack of campaign

The FoE leadership were perhaps stung by criticism in Undercurrents of their lack of support for the ConSoc anti-nuclear campaign. As UC reported in spring 1975 *"FOE are continuing their low key campaign. They are concentrating on building up a solid base of well-informed opinion in the country as their first priority; they are trying to stir up local opposition at proposed power station sites; and Walt Patterson is writing a new pamphlet- The Fissile Society"* (Undercurrents 1975d). Walt Patterson had indeed been trying to interest FoE members in nuclear issues, without much success (Patterson 1996). The nuclear debate was in the elite media but not at the grass roots. FoE's defence of its lack of nuclear campaign is intriguing, and perhaps disingenuous, in the light of its subsequent activities. UC reported *"FOE pointed out that they couldn't orchestrate an anti-nuclear campaign from Poland St' [their London (head) office]"* (Undercurrents 1975d). This UC 11 believed saying *"This is certainly true: they have a highly anarchic constitution which allows each local group to decide for itself what issues to campaign on"* (Undercurrents 1975d).

The relationship of FoE local groups to the head office was certainly complex and a source of much conflict, but while the constitution may have been anarchic (a contradiction in terms?), the power always lay with the head office as local groups frequently complained (Weston 1989; Lamb 1996). As Tom Burke, the first local groups co-ordinator appointed in 1972, reminisced on the London office in that day, *"These were mythical figures, magical people we were in awe of"* (Lamb 1996: 80). Furthermore he saw his job in writing the first FoE Newsletters for local groups as *"mobilising the groups to support the campaigns"*. He became Director of FoE in



1975, and with what Lamb calls his 'robust management style' was able to focus and direct FoE's campaigns towards what Burke termed 'achievable objectives' instead of "*dithering over the directions its campaigns should go*" (Lamb 1996: 92).

The lack of focus, and radicalism, in FoE in early 1975 was clear to UC when it said "*there is a widespread realization that FOE is about something more important than collecting wine bottles and wastepaper, but this feeling has yet to crystallise into a coherent consensus. Hopefully, when it does, the results may be quite startling*". It then urged "*disaffected radicals of all kinds to join their local FOE group... and to work to turn it away from garbage collection to more serious tasks*" (Undercurrents 1975d). FoE's activities were defended in a letter to Undercurrents No.13 by Dave Roberts the local co-ordinator for Cardiff FoE who agreed that FOE needed a more radical membership to achieve its goal of "*the universal adoption of sustainable and equitable life styles*" but he did not mention any nuclear issues (Roberts 1975).

### 3.3.2 Development of a campaign

As Tom Burke commented on local groups there "*was no groundswell from the grass roots*" for an anti-nuclear campaign in 1975 unlike that for whales and transport where they led (Burke 1996). They did not know about nuclear issues, and there was much 'ignorance and apathy'. He remembers that "*John Price* <sup>26</sup> *and I went for a 2 week tour of local groups in 1974 telling them of nuclear issue. The oil crisis had focussed attention on energy, we saw nuclear power as a pivotal issue, the nub of the wider energy debate and societal issues. To us nuclear was litmus test of social choice. We posed the question 'Do you want to live in a nuclear society?'*" (Burke 1996). Burke remarked that FoE started to campaign on nuclear "*because we had the intellectual resources: Amory Lovins, Walt Patterson, John Price, Czech Conroy, Mike Flood, and Peter Harper on the margins. The original thinking was done by Amory Lovins and John Price, they drew in and analysed the material. Walt Patterson was the energy journalist and polemicist, he could interpret and communicate, and had a fine sense of judgement*" (Burke 1996). So as Burke remembered it "*the anti-nuclear campaign had the resources, opportunities and interests of these people with a profound understanding of energy, which lead them to develop sustainable lifestyles as they were convinced nuclear was the wrong direction. We were paving the way, bringing the message to the public*" (Burke 1996).

Thus it was a combination of factors that launched FoE's anti-nuclear campaign in mid 1975: a more focused head office, committed and expert staff, more radical local groups and an issue on which to campaign: BNFL's expansion plans at Windscale. FoE's first nuclear campaign event was in May 1975 when it held a tenth 'birthday party' for the still unfinished Dungeness AGR station, attended by many people from the nuclear industry and the media, and for which it



published a four page tabloid called Nuclear Times (Patterson 1979: 159). On its front page was a story about BNFL's expansion plans, which would make Windscale "*one of the world's main radioactive dustbins*". This story attracted little attention as BNFL's plans were well known to the press and generally supported. It had been public knowledge since late 1974, and The Observer had even carried an article entitled 'Swedes Dump Atom Waste on Britain' on 20 April 1975, without creating any public furore (Hawkes 1975b; Wynne 1982: 48). <sup>27</sup> Even Undercurrents did not publicize this remark, and reviewing Nuclear News in the autumn of 1975 it just said "*The excellent first issue contains a guide to the nuclear industry, the nuclear fuel cycle and an account of the planned British reactor programme, plus information on researching and organising against your local reactor*" (Undercurrents 1975e).

Then, on the 21st October 1975, the Daily Mirror had a front page story, headlined 'Plan to make Britain World's Nuclear Dustbin' followed in November by another story entitled 'Sign Here for Japan's Atom Junk' (Williams 1980: 289). These typical Mirror style 'shock reports' on the proposed Windscale reprocessing plant bought widespread publicity to FoE's nuclear campaign (Patterson 1985: 111). With increased activist interest FoE held their first 'Campaign Workshops' weekend in November 1975 on nuclear issues and developed a coherent strategy for local activists (Patterson 1984: 149). They were thus in a good position to assume national leadership of the 1970s anti-nuclear campaign which up till then had involved only campaigning by local groups.

### **3.4 Early Local Campaigns**

Local branches of ConSoc and FoE were involved in the mid 1970s in the formation of local anti-nuclear groups which campaigned against the nuclear power stations at Heysham, Torness, Sizewell and Hinkley. The largest and best known of these were Half-Life (at Heysham) and SCRAM (at Torness). Little is known about the other two, Survival (at Sizewell) and the Nuclear Reactor Vigilantes (at Hinkley). With Windscale front page news from late 1975, new opposition groups sprang up, and long established ones, not previously involved with nuclear matters 'joined the fray' (Patterson 1979: 159). However the proliferation of groups led to the impossibility of agreeing on a unified body to present the opposition case at the Windscale inquiry, and further complicated fund raising.

#### **3.4.1 Half-Life**

The first specifically anti-nuclear organization in the UK, Half-Life, was formed in Lancaster in early 1975 to campaign against the nearly completed Heysham AGR. It consisted of activists from Lancaster as well as members of the Whitehaven branch of FoE and the North Lancs.



branch of ConSoc (see Welsh 2000: 235 note 1, Williams 1980: 289, Conroy 1978: 6). A founder member was Paul Smoker, a long time anti-nuclear campaigner and peace activist at Lancaster University, who according to Ian Welsh, had been almost alone in voicing concern about routine releases of radiation from Heysham in articles in the local papers from 1971 (Welsh 2000: 235 n1).<sup>28</sup>

The ConSoc branch secretary Avril Orlowski wrote as early as May 1974 to Conservation News over its nuclear concerns “*We are to apply, not very optimistically, for representation on the local Nuclear Liaison Committee. We have an AGR power station under construction in the borough*” (Orlowski 1974). There was further mention of Half-Life under the section ‘Public campaign on nuclear power’ in the 1975 ConSoc Annual Report (ConSoc 1975: 16):

*“It is worth mentioning in conclusion that another anti-nuclear group, 'Half-life' was established in North Lancashire to oppose the Heysham nuclear power station proposal; Mrs. Orlowski, the secretary of our branch, took an active part in setting up this group and arranging a 'nuclear awareness week' that included two symposia and much effective publicity”.*

This ‘nuclear awareness week’ at the beginning of June 1975, which was reported on in UC was the typical mix of street theatre, public meetings and debates. Half Life described their campaign as “*a multifaceted attack on nuclear power, comprising local and national lobbying, a sustained publicity campaign and, when we have sufficient community support, direct action where necessary. A crucial part of the campaign is to press for alternative energy policies*” (Half Life 1975). During this week of action there was a public meeting attended by about 80 people (Mathews and Usher 1977: 153), with Half Life reporting that the response of the public was encouraging, and that “*local councils and MPs are pressing questions about nuclear safety to the elctronuclear establishment*” though the CEGB “*has resolutely boycotted our public debates and refused to answer questions*” (Half Life 1975). Throughout 1975 Half Life continued their campaign against the Heysham station, which was widened to opposition to the proposed Windscale reprocessing plans, and a few days after The Mirror story, Half Life presented a petition on the 25 October 1975 to Downing Street against the proposed plant (Kemp 1975). There were also demos by Half-Life and ConSoc at Barrow-in-Furness (the local port for Windscale) against the arrival of spent fuel from Sweden destined for Windscale (Breach 1978: 95). These attracted the sympathy of dockside cargo handlers at the port of Barrow who voted (in late 1975) not to unload any more casks of spent fuel bound for Windscale, a decision which was later reversed by one vote (Patterson 1976a). BNFL, disturbed at these stirrings of public dissatisfaction, hastily arranged a meeting at the town hall in Barrow on Friday 12



December 1975, with a near capacity audience. According to Patterson's report in the journal Environment (Patterson 1976a):

*"Local dignitaries, union representatives and spokesmen for Half-Life and Friends of the Earth were invited to join BNFL on the platform to air their differences. ...The discussion was wide ranging and intermittently heated. Local residents demanded reassurances about possible hazards associated with the transport of radioactive materials through Barrow, while Friends of the Earth spokesmen expressed more concern about plutonium security, proliferation implications, and the economic validity of the reprocessing industry".*

The next day, on Saturday 13 December, there was a Half Life rally at Barrow with Patterson reporting that *"a generally good-humoured crowd of protestors, some from other nuclear sites, staged a demonstration through Barrow, carrying banners and talking to bystanders about their reasons for objecting to the nuclear shipments"* (Patterson 1976a).

#### **3.4.1.1 Half Life's campaign for a public inquiry**

On 1 June 1976 The Times reported that Half-Life and the local branch of FoE had decided to press for a public inquiry to be set up as soon as BNFL submitted its expansion scheme for planning approval to Cumbria County Council - which it did that month (Boyle 1983: 21). But the Council would not be rushed into taking a quick decision.<sup>29</sup> The activities of the protestors had begun to cause resentment among some local people, particularly trade unionists who worked at the Windscale plant. Many trade unionists did not share Half-Life's fears about the environmental and other hazards of Windscale and they welcomed the prospect of 1,000-2,000 extra jobs being created in the area (Boyle 1983: 22). This view was supported by the national executive of the General and Municipal Workers Union (GMWU) who, at their annual conference on 8 June 1976, opposed a motion calling on the Government to hold a public inquiry. Local trade unionists also started a petition supporting the Windscale expansion plans, to counter an opposing one organized by South Lakeland (near Kendal) District Councilor Edward Acland.<sup>30</sup>

Cumbria County Council as the main part of their consultation exercise, organized a public meeting at Whitehaven Civic Centre (or Hall) for the evening of 29 September 1976. It was well attended by about 800 people and according to Conroy *"This tense and impassioned meeting was widely covered by both national and local media, Radio Carlisle, broadcasting the whole meeting live"* (Conroy 1978: 6). Polly Toynbee reported in The Observer (3 October 1976) *"The hall was packed: 800 people, many diverted into an overflow room, stayed through the whole four hours in the heat and discomfort of the dazzling television lights. The battle lines were drawn for a classic confrontation, with environmentalists and residents on one side, and*



*Windscale employees (some in company ties) and their families on the other; safety versus jobs”* (quoted in Boyle 1983: 24).

Friends of the Earth, Half-Life, the Conservation Society, the Town and Country Planning Association and others all made impassioned appeals for the matter to be referred to a public inquiry. Paul Smoker, from Half-Life, made clear that the environmentalist’s objection was only to one out of the three BNFL proposals: the proposed thermal oxide plant - the THORP plant - and they were not opposed to the refurbishment of the Magnox reprocessing facilities, or the development of a method for glassifying high-level wastes. The ConSoc newsletter again reported that over 800 people attended this meeting, with Half-Life and FoE Lancaster “*to be congratulated on the results of their efforts to ensure a truly ‘public’ debate*” (Kemp 1976d). In the autumn of 1976 there was another Branch report from Half Life in Conservation News outlining its campaign for a Public Inquiry Commission (Orlawski 1976).

On 2 November 1976, in spite of the protests expressed at this meeting and objections lodged with the Council, Cumbria Planning Committee decided that in principle they were ‘minded to approve ‘ BNFL’s application. But wanting to pass the ultimate decision to Peter Shore, the Minister responsible, they decided to give him every available chance to ‘call in’ BNFL’s proposal by declaring that it considered BNFL’s proposals to be a “*departure from a fundamental provision of the County development plan*”. If however, Mr. Shore had not called in the application in 21 days, the committee would go ahead and ratify the permission to which it had already in principle agreed. Thus they passed the ‘buck’ to the national government.

### **3.4.2 Network for Nuclear Concern**

The Network for Nuclear Concern (NNC) was according to Brian Wynne (1982: 98) a regional grass roots anti-nuclear group, whose main constituent was Half Life and local Cumbrian FoE groups. It was founded and co-ordinated by Edward Acland, a District Councilor from near Kendal, and one of the local organizers of opposition to THORP (Breach: 1978: 99). In November 1976 Acland organized a petition, collecting 28,000 Cumbrian signatures in less than 10 days from November 12th, calling for a public inquiry (Wynne 1982: 82). In contrast the Windscale workers collected 18,000 signatures over several weeks demanding a go-ahead for the project (Cook 1976).

These petitions came at a sensitive time in mid November 1976, just when Shore was deciding whether to ‘call in’ the planning proposal. The trade unionists presented theirs first to Shore, on 19 November, when a deputation led by Bill Maxwell of the GMWU traveled to London from Windscale (Boyle 1983: 27). Two days later, Acland, presented his petition against the Windscale expansion.<sup>31</sup> In an interview with The Guardian he said there were “*overwhelming reasons for*

*the plans for a large oxide fuel plant to be put before a properly constituted planning commission. The issues are international and national, not local, and they require expertise and a depth of understanding of the implications which are far beyond those available to local authorities”* (Tucker 1976).

By the time of the Inquiry NNC had also gained the membership of several hundred individuals, a Mothers Union group, and a coalition of Quaker Meetings, and the Northern Friends Peace Board (Wynne 1982: 98). NNC decided to be represented at the Inquiry, and to concentrate on safety and radiation release issues. It decided its best course was to use an amateur advocate, well versed in the technicalities, and also most importantly open to the groups influence; and Brian Wynne volunteered for this position and became the group’s spokesman.<sup>32</sup> He had no legal background, but learnt rapidly helped by other barristers, including ‘opposition’ ones, present at the Inquiry who used to discuss cases and methods with him in the evenings (Wynne 1996).

At the Inquiry NNC concentrated on the issues of environmental discharges and radiobiology, and was keen to show what a local group could achieve in putting up a highly technical case without use of a professional advocate (Wynne 1982: 103). It therefore rejected a coalition with the TCPA, and the possibility of using Sir Frank Layfield<sup>33</sup> - reputedly the best planning silk in the country - who was TCPA’s QC, and instead allied itself with PERG, with Wynne acting as an adviser.

### 3.4.3 SCRAM

SCRAM, the Scottish Campaign to Resist the Atomic Menace grew out of a loose umbrella organization formed in November 1975 which included FoE, ConSoc, Edinburgh University Ecology Group, Science for the People and others (Hall 1986:142). However according to Ian Welsh, a SCRAM activist, it formed as a splinter group from Edinburgh FoE with one activist saying to Welsh *“FoE wanted us to campaign to save Otters- well sod that when the world is being poisoned by plutonium”* (Welsh 2000: 156). SCRAM’s view was that nuclear power was important enough to require a specific campaign focus and could not be just part of wider environmental remit. FoE and ConSoc had participated in the original two week public inquiry into Torness in mid-June 1974 at which Walt Patterson of FoE had appeared as a witness.<sup>34</sup> The two organization, and Patterson, had worked together in 1973 on North Sea oil issues, particularly on opposition to plans to build concrete oil platforms at Drumbuie.<sup>35</sup> This campaign run by an umbrella organization called the North Sea Oil Coalition involved representation at a public inquiry. The decision in their favour in August 1975 greatly encouraged Patterson and other groups. As Robert Lamb commented on FoE’s performance *“in the Drumbuie process it*



*had learned that public inquiries were winnable and that there was scope to play a worthwhile co-enabling role on the side of a local community defending a prized environment against energy Goliaths and the powers-that-be*” (Lamb 1996: 84).

However defeat over the Torness Inquiry in 1974 galvanized the local opposition. As Tony Hall commented *“But when the inquiry report showed that their arguments had been ignored, they set out “to show that public opinion was on our side”. And, as one of the members put it “when public opinion was ignored, direct action was the only tactic left open to us” ”* (1986: 142). In April 1976 SCRAM organized an occupation of proposed Torness site. Hall reckons this was *“the first example of direct action to oppose a nuclear power station in Britain”* (Hall 1986: 142). A hundred protestors camped the weekend at (the then vacant) site of Torness. However the style was more 'free festival' than political. According to UC who publicized the event *“There will be music (a pipe band and folk groups) in the barn on the Thorntonloch campsite, an anti-nuclear exhibition, beachcombing and kiteflying competitions, and, on the Saturday night, a public meeting in Dunbar”* (Undercurrents 1976a).

Another similar 'free festival' was to follow at Torness in May 1978, when a much larger weekend camp on 6 and 7th May was attended by 4,000- 5,000 people (Undercurrents 1978d). Then in October 1978 came the first serious 'direct action': a month long occupation of Half-Moon Cottage. This received much publicity and argument about non-violent protest in Peace News.<sup>36</sup> However nuclear protest in Scotland pre 1978 was mainly based on the issues of uranium mining and waste disposal. In February 1977 several hundred inhabitants of the Orkney Islands demonstrated against the prospect of uranium mining, while 3,000 people attended a rally organized by COND (Campaign Against Nuclear Dumping) at Loch Doon, Galloway in June 1977 against the possibility of it becoming the site for nuclear waste (Rudig 1990:186-188).

SCRAM was an objector at the Windscale Inquiry, focusing on opposition to nuclear waste disposal in Scotland, and calling for an end to nuclear power. Both these positions bought it into conflict with FoE, particularly over FoE's (reluctant) support for the AEA's drilling programme for disposal sites in Scotland, something that SCRAM was uncompromisingly opposed to (Wynne 1982: 108).

#### **3.4.4 Survival**

Opposition to the proposed SGHWR nuclear plant at Sizewell was led by Survival, a *“lively Cambridge based coalition of FOE and ConSoc groups”* according to Undercurrents (1976a). On 24 April 1976, simultaneously with demonstrations at Windscale and Torness, Survival planned to organize at Sizewell *“a picnic with home-brew beer, street theatre and music... The*

*workers and management have been invited along and Survival hope to arrange an impromptu debate on nuclear power on the beach. They are also, as a publicity stunt for the local media, putting on street theatre and dumping Nuclear Dustbins ('Not to be opened until Easter 5000,000 AD') in the Market Square"* (Undercurrents 1976a). How this event went is unknown since in the next issue UC only reported on the Windscale demo (Undercurrents 1976b).

### 3.4.5 Nuclear Reactor Vigilantes

The group 'Nuclear Reactor Vigilantes', was Somerset based and active in demonstrating against the Hinkley Point Magnox and AGR reactors. Little is known about this group, save that ConSoc minutes in January 1976 report that this group, organized by Jane Buxton from South Petherton, was planning possible sit-ins, protests, fasts at Hinkley Point and needed a leaflet to hand out explaining why they were protesting (ConSoc 1976a: 5). In UC there is a report about a demonstration at the Open Day (no date given) for the Hinkley Point AGR, which was organized by the Somerset branch of FoE and the Nuclear Reactor Vigilantes and aimed *"to further the 'public debate' requested by Tony Benn by handing out leaflets which questioned nuclear power"* (Undercurrents 1977c). The demonstrators were quickly escorted off the premises by Security, but managed to give out 500 leaflets to members of the public and Hinkley employees.<sup>37</sup>

### 3.5 Network of Groups

Contemporary commentators found it not easy to describe accurately or adequately the extent and the nature of the anti-nuclear movement. Surrey and Huggett remarked that (1976: 305):

*"Rather than being a united movement with common interests, the opposition comprises coalitions of different interest groups, with some opposing nuclear plants in their locality, some general environmentalist groups wanting tighter controls, and some specifically anti-nuclear".*

Another observer saw a strong anarcho-liberationist streak mixed in with conservationist, ecological and politically pink threads (Weightman 1979: 310). Weightman saw four disparate strands:

1. the broad centre environmentalists, mainly middle class - like ConSoc and FoE.
2. the orthodox left wing -like the Socialist Workers Party.
3. Scargill and Yorkshire miners; and
4. a conglomerate of anarchists and the 'brown bread and sandals brigade' - a euphemism for hippies.



There was a wide variety of organizations and reasons for opposition, and as Weightman concluded the national movement looks distinctly disorganized, eco-minded, left-of-centre, and rather lacking in muscle, but there was local group strength as at Torness, but overall *“The people who join such groups would probably oppose a coal fired power station or an airport on the same site, and many are not perhaps, strictly anti-nuke”* (Weightman 1979: 311).

The section below outlines the main groups that sprung up to oppose the Windscale expansion and which coalesced into a national network. Also involved were individuals from pre-existing amenity, peace and religious groups, who tried to steer their organizations into taking up an anti-nuclear position. For instance the National Federation of Women’s Institutes passed a resolution in 1977 urging the government to postpone the building of the FBR until a better way had been found of disposing of the waste, however it did not receive a two-thirds majority needed to campaign on the resolution (Weightman 1979: 311).

### **3.5.1 Nuclear Information Network**

On 14 October 1976 a meeting was called by (London) Greenpeace and other organization to discuss the possibilities of joint action on nuclear matters. Twenty nine people from 15 organizations attended plus members from the Open University with *“much of the discussion centred on the differences, mostly of emphasis, between the groups”* (NIN 1976). A second meeting was held on 11 November 1976 and it was decided to set up a small working party to sort out *“the practical details of making a working link without spawning a new organisation”*, and to avoid unnecessary duplication (NIN 1976). The name proposed for this organization was ‘Central Information on Nuclear Energy Control’ (CINEC).

Beryl Kemp from ConSoc was a member of this Working Party, along with Martin Lowe (Greenpeace), Sheila Oakes (National Peace Council), Sue Boothman and Martin Aitken. They decided to call a public meeting for 11 January 1977 at Friends House, Euston Road, London and another on 30 April at the TCPA Institute, London (NIN 1977a). By then the organization was known as the ‘Nuclear Information Network’ (NIN). This meeting was attended by 36 people from 24 organization - including CANTO, ConSoc, FoE, Greenpeace, Half-Life, SCRAM and SERA besides various peace groups. The meeting was dominated by the upcoming Windscale Inquiry, and how best to co-ordinate evidence. The 10 proposed objectors at the Inquiry outlined their cases, with Czech Conroy from FoE saying FoE’s main expertise ‘lay in economic and technical aspects’.

NIN saw itself as a co-ordinating and information network or exchange, not an organization, it having no staff and a very low subscription. It saw its value in being able to bring together a wide variety of environmental, political and peace groups to campaign on the Windscale issue,

with groups still able to retain their diversity of viewpoints. As such it played an important role in building the anti-nuclear movement, and in mobilizing people. By mid 1977 it had 42 organization on its 'membership' list, many of them almost 'one-person groups', such as Alternative to Nuclear Technology (Mike Filgate), Branscombe 2000 (Sir Kelvin Spencer), Cambridge Energy Group (Tom Pettitt), Campaign against Nuclear Energy (Ken Barker), Nuclear Reactor Vigilantes (Jane Buxton), People for a Non-Nuclear world (Renee-Marie Parry), Safe Energy Petitioners (Jane Pink), and South Yorkshire Nuclear Action Group (Richard Turner).

There was a meeting on 30 April 1977 to co-ordinate objectors evidence. The meeting of NIN on 26-27 November 1977 was a two day post mortem on the Windscale Inquiry, and in particular FoE's (strained) relationship with the other groups. Held at the TCPA, London it was attended by 21 groups and 30 people (NIN 1977b). On the first day (which FoE did not attend) each group present at the Inquiry gave lessons learnt from attending the Inquiry, in terms of presenting their case, co-ordinating with other groups, and preparing for the expected CFR-1 inquiry.

On the second day Czech Conroy from FoE attended; his disowning of CANTO a year previously had already caused bad feeling further heightened by the perceived lack of co-operation by FoE with other groups at the Inquiry. Conroy was unapologetic, stating that FoE's case was threatened by the disparate number of groups giving evidence and by the duplication of evidence.<sup>38</sup>

### 3.5.2 CANTO

The group 'CANTO' was founded by John Hanson, a film maker, in late 1976, with assistance from Edward Dawson - formerly an employee of ConSoc from 1973-77. ConSoc reports that it had "*no identifiable membership or structure*" (ConSoc 1979: 1), and its 'supporters list' is very similar to NIN's. Its main activity (and claim to fame) was the organization of the first anti-nuclear rally at short notice in Trafalgar Square on Saturday 20 November 1976 three days before the expiry of the deadline to 'call in' the Windscale application (CANTO 1976; Morris 1976). Also Edward Dawson, organized a letter to The Times on Windscale, that was published on 5th November 1976 signed by Anthony Woolf, Chairman of the Lawyers Ecology Group and other distinguished lawyers.<sup>39</sup>

John Hanson is credited with having influential contacts, firstly in attracting 'celebrities' to attend this rally, and then using his contacts to obtain from Sir James Goldsmith a donation of over £10,000 for the Windscale Appeal and a similar one for FoE (ConSoc 1979: 1). It also



dominated the Windscale Appeal Committee, out of its 5 members two were from CANTO (John Hanson and Edward Dawson).

### 3.5.3 People for a Non-nuclear world

This group, according to Conroy, “*was an ad hoc group of individuals*” fronted by a Renee-Marie Croose Parry (Conroy 1978: 75). On its headed notepaper it had an ‘ad-hoc committee’ of 21 people including E.F. Schumacher and James Robertson, as well as activists John Hanson (of CANTO) and Beryl Kemp (of ConSoc). In April 1977 it rapidly collected over 2,000 signatures to an open letter to President Carter in support of his nuclear policy and also raised £10,000 (Conroy 1978). Some of this was used to publish the letter, as a full page advertisement, in The Guardian on 2 May 1977 (see Boyle 1983: 35 Figure 17). The rest was donated to objectors at the Windscale Inquiry, with £2,000 given directly to the Windscale Appeal, and £500 to ConSoc (ConSoc 1979:1).<sup>40</sup>

In a letter to Leonard Taitz, in August 1977, Renee-Marie Parry refers to “*the mass meeting at Trafalgar Square in the Spring, which you suggest*” Parry 1977). This was indeed to take place in April 1978, organized by FoE with Arthur Scargill (of Energy 2000) as the star speaker.

### 3.5.4 PERG

PERG (The Political Ecology Research Group) based at Oxford consisted of about a dozen scientists who undertook detailed and ‘non-partisan’ studies on the social and political issues of nuclear power particularly proliferation. Peter Taylor<sup>41</sup>, PERG’s co-ordinator (and member of both FoE and ConSoc), attempted to be an intermediary between all the groups seeking representation at the Windscale Inquiry. At the Inquiry Taylor worked with Brian Wynne from NNC on safety and radiation issues - including public acceptability- which received favourable publicity from Ian Breach, the New Scientist reporter (Breach 1977j).

### 3.5.5 Society for Environmental Improvement

The Society for Environmental Improvement (SEI) was founded by Gerard Morgan-Grenville and was responsible for the setting up of the National Centre for Alternative Technology, near Machynlleth, Wales in late 1973. Gerard Morgan-Grenville was interested in taking part in the anti-nuclear campaign, and the January 1976 minutes from the ConSoc Council reveal that he, in discussions with John Davoll and Edward Dawson, was interested in the possibility of non-violent resistance action, similar to that taking place in Europe. Morgan-Grenville attended many of the NIN meetings and became a founder member of the Green Alliance (see Section 8.4.3).

Because of the SEI's interest in alternative energy sources and scenarios it became involved in the Windscale Inquiry, producing in June 1977 the report *An Alternative Energy Strategy for the United Kingdom* (Todd and Alty 1977). This included a foreword by Sir Martin Ryle, who in May had written in *Nature*, expressing his support for alternative energy sources, particularly wind, rather than nuclear power (Ryle 1977). At the Inquiry Justice Parker expressed his interest in hearing about non nuclear energy options. Thus the SEI presented evidence, using John Tyme<sup>42</sup> their lay advocate, on non-nuclear energy strategies based on coal and renewables. Witnesses included Arthur Scargill (active in Energy 2000), on the need to double coal output by the end of the century, Stephen Salter on wave energy, and Peter Musgrove on wind energy (Breach 1977d).

### 3.5.6 SERA and the Left

SERA, the Socialist Environment and Resources Association, mainly through the efforts of Stan Rosenthal, Tony Webb and Dave Elliott was actively involved in raising the nuclear power issue in the Labour movement. Their campaign concentrated on Trade Union rights and health and safety issues, particularly after the Windscale strike in February 1977 (Boyle 1983: 38). It was also the first to emphasize the employment potential of investing in renewables and conservation instead of nuclear power. SERA was a founder member of NIN.

SERA's opposition to BNFL plans was, as Godfrey Boyle commented "*founded not only on a concern for the environment, but on a libertarian socialist conviction that the widespread use of nuclear power would require an authoritarian society which would increasingly infringe the rights of working people*" (Boyle 1983: 51). SERA presented evidence at the Windscale Inquiry. Its witness Dave Elliot argued for alternative energy technologies as these would enhance workers' creative and productive skills. In contrast the development of nuclear power, and the construction of THORP in particular, were "*steps on the road to deskilling society and exacerbating structural employment*" (Breach 1977h).

The other 'radical' group to oppose nuclear power (and to have a general interest in environmental issues) was BSSRS (the British Society for Social Responsibility in Science), an association of radical (and generally Marxist) scientists. For a statement of its views on nuclear power - "*a form of economic, and by implication, social development, seriously at odds with the needs of socialist society*"- see an article in the November 1976 issue of their journal *Science for People* (Croll and Buck 1976, extract in Boyle 1983: 51). Policy on nuclear power varied across the Marxist groups. The Socialist Workers Party (SWP) came out firmly against nuclear power, supporting the Windscale rally in April 1976 and devoting considerable space in its paper *Socialist Worker* to the nuclear issue in 1977 (Elliott 1978a: 130). The other major



New Left group, the International Marxist Group, also came out against nuclear power, whilst other groups, such as the Workers Revolutionary Party, only opposed nuclear power under capitalism. As Dave Elliott concluded *“In general, while many left groups are currently critical of nuclear power as developed by capitalism, there still remains a belief, at least amongst some of the more traditional Marxists, that nuclear power could be beneficial under socialism”* (Elliott 1978a 131).

### 3.5.7 Energy 2000

Energy 2000 was set up by Leonard Taitz, ConSoc chairman from 1977 to 1980, and Convenor of the Transport Working party, with the backing of Arthur Scargill, President of the Yorkshire Miners' Union.<sup>43</sup> It was formed at Barnsley in Yorkshire on 2 April 1977 and aimed to not only oppose nuclear power but to press for research into other energy sources, not only coal but also renewable energy sources (Boyle 1983: 34). It presented itself as a cross-party lobby group and was able to attract the support of many MPs interested in energy issues, such as Robin Cook (Labour), David Penhaligon (Liberal), and Nigel Formen (Conservative) as well as outside groups (Tucker 1977).

Taitz's association with Arthur Scargill was controversial amongst some ConSoc members who viewed Scargill as an 'extreme left-winger'. In a letter to J. H. Goodland (ConSoc chairman in 1968) in February 1977 (copied to Lord Avebury) Taitz defended his decision to approach Scargill for assistance in the anti-nuclear campaign, writing *“When I approached Mr. Scargill, it was not in his capacity as a Marxist or extreme left-winger, but as a leader of a powerful trade union, who expresses anti-nuclear views... [that] come from a powerful personal belief that nuclear energy is dangerous”* (Taitz 1977).

Taitz modeled Energy 2000 on his previous association with Transport 2000<sup>44</sup>, where he was Chairman. He strongly believed in coalitions between conservation bodies and trade unions, and in the need to seek powerful allies in order to be effective. Taitz wrote *“On a more fundamental level, it seems to me that the Conservation Society dare not reject support where it is offered, and indeed must seek for allies where it finds them... One of the factors that has prevented the Conservation Society becoming a more powerful organisation, is that many of the people who would have supported us, have considered it in the past to be too elitist and right wing”* (Taitz 1977). Writing 18 months later to Beryl Kemp, Taitz said after his meeting with Tony Benn and Peter Shore *“This was an extremely useful occasion and I think firmly illustrates the value of our association with the Yorkshire Miners through Arthur Scargill. It gives us a great deal of muscle, at least while the Labour Party is in power, that we would not otherwise have”* (Taitz 1978).

Arthur Scargill brought an air of left-wing radicalism to the anti-nuclear movement. He was one

of the main speakers at the Windscale demonstration in London in April 1978, and his call for civil disobedience was well received (see section 4.3.2).

The next chapter describes how these disparate groups attempted to present a common front at the Windscale inquiry, and how anti-nuclear enthusiasm was no substitute for nuclear expertise, at least in the eyes of the national media.



## **4. The Windscale Inquiry: glory or fiasco?**

This chapter examines the campaign by the anti-nuclear movement from late 1975 to 1978 against the plans by BNFL for an expansion of the Windscale nuclear reprocessing plant (THORP). This campaign started when the Daily Mirror dramatized BNFL's proposals with a front page headline 'Plan to Make Britain World's Nuclear Dustbin' on Tuesday 21st October 1975.<sup>45</sup> It culminated in the Windscale Inquiry in late 1977 attended by a wide variety of disparate groups.<sup>46</sup> The rejection of their case by the Inspector in early 1978 caused shock and recrimination amongst them, and led to deep changes in the environmental movement.

### **4.1 The Great Energy Debate**

Tony Benn, Secretary of State for Energy, in the light of media interest and environmentalist concerns over BNFL's proposals, was keen to practice his ideas on 'open government', and thus have a 'great debate' on all aspects of nuclear policy in Britain. To open this debate BNFL, at the suggestion of Tony Benn, hurriedly organized a public debate, which took place at Church House, Westminster, on the afternoon of Thursday 15 January 1976. Principal speakers were BNFL's Con Allday and Peter Mummery for BNFL, opposed by Walt Patterson from FoE and Paul Smoker, from Half Life. As Conroy commented (1978: 5):

*"This was the first time the advocates of nuclear power in Britain had met their opponents head on in a public forum of such importance... The debate itself was rather inconclusive as might have been expected from such diametrically opposed views meeting for the first time".*

New Scientist was less complimentary, saying that *"nothing could counter the poor showing of the anti-nuclear movement"* with only Walt Patterson putting on *"anything like a convincing show"* (NS 1976a). While Patterson's questioning of the economics and technical basis of the reprocessing business, and lack of hostility to nuclear power won the audience's respect, Smoker's overtly political case was judged to have carried *"little weight with the nuclear establishment and alienated some of the opponents of the BNFL contract"*- presumably Walt Patterson (NS 1976a). As Boyle commented *"To judge by the DEn decision which eventually followed the debate, the arguments of those in favour of the Windscale expansion must have been more persuasive than those of the opposition"* (Boyle 1983: 20). Harold Bolter, in his insider account from within BNFL, has a more cynical comment on Benn's motivations for this set-piece debate, saying *"In politics, little is believed to have happened unless it has taken place in London"* (Bolter 1996: 69). He wrote that Paul Smoker accused BNFL and the Department of 'news management' in organizing the discussion, and Bolter comments *"of course he was*

right". Furthermore the debate "*seemed to do the trick as far as Benn was concerned*" for on 12 March 1976 Benn announced that BNFL could take on further reprocessing work for overseas customers and "*that this statement took most of the steam out of the debate*" (Bolter 1996: 69).

This decision to press on with reprocessing was encouraged by the perceived "*poor showing of the anti-nuclear lobby*" at the Church House debate which encouraged the nuclear establishment and made them hopeful that they had "*eliminated the possibility of repeat performances for other topics, such as the fast breeder reactor*" (NS 1976a).

#### 4.1.1 The Windscale Rally

The first major event of the anti-Windscale protestors was a rally attended by over 600 people at Windscale on Saturday 24 April 1976, organized by FoE and Half Life. The FoE London office chartered a train - dubbed the 'Nuclear Excursion' - to take 420 people there and back and this train generated much publicity for FoE. As UC reported "*Tom Burke, the pugnacious director of London FOE, hopes these rallies will finally kill off the 'soft Schweppes' image that many people still have of FOE*" (Undercurrents 1976a). FoE however was against direct action preferring debate and discreet lobbying. As UC commented on the plans for this event "*The plant however will not be picketed as originally planned. Cumbrian County Councilors are being lobbied discreetly to refuse planning permission... It is thought that direct action might be counter-productive*" (Undercurrents 1976a).

The next issue of UC carried a full page report on the rally, but mentioned only FoE's participation and give prominence to Walt Patterson's contribution. As UC remarked "*All in all FOE can be well pleased with the results of their first foray into direct action on the nuclear issue. FOE received a fair amount of publicity and they took the issue out of the realms of rarified abstraction and brought it to the people*" (Undercurrents 1976b).

Again the New Scientist report was not so supportive, talking about the bland character of the discussion <sup>47</sup>, the minimal attendance by local people and the clear trade union support for nuclear power (NS 1976b). However UC was concerned about the emphasis most of protestors put on safety issues, which "*in many ways is the issue on which nuclear power is least vulnerable*".

Moreover it remarked nuclear's safety record "*compares favourably with any comparable industry, as the BNFL spokesmen were quick to point out*". Once again UC felt the need to offer FoE advice saying "*FOE needs to broaden the issue to include economics, social policy and the whole question of the impact of technology on society, before they can hope to turn what is at the moment a minor protest into a major movement*" (Undercurrents 1976b).



#### 4.1.1.1 BNFL's role in FoE Rally

However unknown to anti-nuclear activists, and the reason for FoE's hostility to 'direct action' was FoE being compromised by BNFL. According to Harold Bolter's recollections, he saw FoE's event as a public relations opportunity for BNFL and the chance to gain valuable publicity. He therefore "*decided to negotiate with Tom Burke, Director FoE, and Walt Patterson... to see if we could agree how their day of protest should be organized and managed*" (Bolter 1996: 176). Thus BNFL agreed to help FoE organize their visit to the site, both in its programme and facilities. BNFL agreed to provide speakers and equipment for a debate on the merits of reprocessing in order to keep the demonstrators occupied. As Bolter cynically admitted (1996: 176):

*"...if we refused to get involved in the event the demonstrators, finding themselves without anyone to argue with, would have time on their hands. They might then decide to try to draw attention to their cause in other, more mischievous ways... I had therefore agreed with FoE that the interminable debate planned for the day of protest would take place on land owned by BNFL near the main entrance to Sellafield".*

FoE further agreed to BNFL's policing requests "*The road in between this spot and the site's perimeter fence would be no man's land, which Tom Burke agreed his members would be told not to cross. Anyone who did could be treated as a potential troublemaker and arrested, with the support of FoE*" (Bolter 1996: 176). BNFL then agreed to provide all the equipment, catering facilities, toilets and even a crèche. Bolter wrote "*I asked the Sellafield management to provide a platform, microphones and loudspeakers for the debate, tip off caterers to set up food and drink marquees, as I wanted to keep the demonstrators in well-fed good humour. We even provided portable lavatories and a creche*" (1996: 176).

FoE supporters arriving were totally unaware of BNFL's role, just attributing the catering facilities to "*some enterprising locals selling coffee and hot dogs*" (Undercurrents 1976b). Finally Bolter had a leaflet prepared explaining reprocessing and "*arranged for the leaflet to be left on the train taking supporters back to London*". Bolter was well pleased with his efforts writing that "*the day went off better than we could have hoped*", saying that one TV commentator, Martyn Lewis, did a piece for ITN news saying he was unsure whether he had been at a pro-nuclear or anti-nuclear rally. Finally Bolter comments that "*FOE muttered something about making the Easter demonstration at Sellafield an annual event, but they have not held one since*"; overall he concluded "*it was a bit of a damp squib*" for FoE. The ease with which FoE was compromised by BNFL, is explained by Bolter because (1996: 176):



*“...it was not in the interests of either FoE or BNFL for there to be any violence. Both organisations wanted to come out of the event with their reputations for reasonableness intact. Their leaders coveted respectability for their views. Tom Burke and Walt Patterson believed that they could stop the reprocessing of overseas fuel, perhaps all reprocessing, by force of argument and assiduous political lobbying... and came close to doing so”.*

The Windscale rally marks the beginning of FoE ascendancy over ConSoc in the anti-nuclear campaign, and also the start of the mass movement. From then on the anti-nuclear campaign was to be seen by the environmental and mainstream press (and future historians) as a FoE campaign. ConSoc gave little mention to this rally, just saying that six members of the ConSoc Energy Working Party had attended (CN 61).<sup>48</sup>

#### **4.1.1.2 Activists criticism of FoE**

London FoE 's handling of this rally was criticised by some local branches, which typified the autocratic relationship between the centre and local branches over organization and tactics. Tom Barrance of Cardiff FoE wrote to Undercurrents saying (Barrance 1976):

*“There was little consultation with local groups over the decision to run a 'nuclear excursion' train... There was enthusiasm both among us and other FOE groups, for the proposed occupation of Torness power station site... however central FOE decided that there was too little press value in lying in front of bulldozers. Even direct action at the Windscale site was judged 'counterproductive' so all the press saw were 600 or so bored and cold demonstrators listening to a succession of uninspired speakers”.*

Barrance further complained about high cost of the train fare (£5+ equivalent to £20+ in 2003 prices), the lack of local representation, apart from Half-Life, and the small response from local people. He concluded *“The rally appeared to fall seriously between the two stools of demo and debate. I would argue that the only way to get our point across without being outmaneuvered by BNFL etc is to use direct action: demonstrations, pickets, occupations - somehow the public must be aroused and informed”* (Barrance 1976). This call for direct action was consistently rejected by both FoE and ConSoc in favour of 'rational' debate and dialogue. Another letter in Undercurrents from Ken Barker, again from Cardiff welcomed Tom Barrance's comments and remarked on *“the deafening silence both before and after the event”* (Barker 1977). He complained about the lack of communication between FOE and other anti-nuclear groups, the poor response from local people, and the possibility of an occupation at Torness. He commented on the lack of any anti-nuclear campaign saying (Barker 1976):

*“Following the Windscale Excursion it seems that there has been very little discussion on a national anti-nuclear campaign. The FoE energy workshop held at Whitsun (June 1976)*



*hardly mention the subject... what is still lacking is sufficient consultation between anti-nuclear groups”.*

He therefore proposed a meeting between active participants in FoE, ConSoc, Half Life, SERA, CND and other interested groups with the aim of forming “*a co-ordinated national campaign to actively prevent the nuclear industry's proposals going ahead*”. This call perhaps resulted in the founding of the 'Campaign Against Nuclear Energy' based on Cardiff FoE, and the 'Alternatives to Nuclear Technology' based on Oxford FoE which had close links to the Oxford based Political Ecology Research Group (PERG). All these three groups participated in NIN.

#### **4.1.2 CANTO demo**

A London based group was CANTO (Concerns Against Nuclear Technology Organisation) formed in late 1976 by a John Hanson. Its first attempt at a national demonstration on Saturday 20 November 1976 was well attended by celebrities but poorly attended by activists (see CN 64). Boyle 1983 wrote (1983: 27):

*“The demonstration, though small in scale, succeeded in snatching a considerable amount of media attention mainly because of the fame of some of the participants: these included actress Diana Rigg, violinist Yehudi Menuhin, the Bishop of Kingston (Hugh Montefiore), television script writer Kit Pedler and Liberal Peer Lord Avebury”.*

These people were not only famous but also long time activists. Lord Avebury was President of ConSoc from 1973-84, and a long time critic of nuclear power, while Yehudi Menuhin was President of ConSoc from 1969-70. Kit Pedler was not only a TV script writer but also an anti-nuclear activist who wrote for Undercurrents and was to appear as a witness for the Windscale Appeal during the Inquiry in 1977. The Bishop of Kingston (Hugh Montefiore) was active in the debate by the World Council of Churches on nuclear energy (Francis and Abrecht 1976), and was to chair public hearings into the fast breeder reactor in 1977 (Montefiore and Gosling 1977).

UC reported dismissively “*A crowd variously estimated to be between 150 and 200 turned up in Trafalgar Square on November 20th to hear a lot of famous people (including Diana Rigg and Higo Montefiore) inveigh against the Windscale planning application*”(Undercurrents 1977a).

This lack of numbers could be because Czech Conroy, the FOE Energy Co-ordinator, had publicly dissociated FoE from CANTO in a letter to The Guardian the day before the demo. This was because Hanson had announced in pre-rally publicity that the event was organized with the participation of FoE (Morris 1976). This ‘embarrassed and infuriated’ FoE, particularly when the low turnout, of about 150 people instead of an expected 10,000 people, received nationwide TV coverage (Wynne 1982: 100). FoE’s mistrust of Hanson caused FoE to distance



itself from the Windscale Appeal, of which CANTO was, in FoE's view a too dominant a member (see Section 4.2). This lack of interest and activity by activists is perhaps reflected in Undercurrents coverage of nuclear power during early 1977. At a time of extensive media coverage on the Windscale application Undercurrents No. 20 in early 1977 had no articles on the nuclear debate, and none out of the 20 letters published were on the anti-nuclear campaign. Again there no letters on this topic in the next issue of Undercurrents No. 21 in spring 1977.

#### 4.1.3 The National Energy Conference

With no sign of the Windscale controversy dying down in the media, Tony Benn, now Minister for Energy, decided to hold another public debate on nuclear power, called the 'National Energy Conference' on 22 June 1976 again at Church House. ConSoc and FoE were invited to submit a joint paper, which was prepared by Walt Patterson and entitled 'Towards a National Energy Strategy' (ConSoc 1976b: 47).<sup>49</sup> Among the 470 members of the 'establishment' audience were ConSoc members Lord Avebury (President), John Davoll (Director), and Beryl Kemp (representing the National Society of Women). While ConSoc and FoE were on the inside, there was a picket outside representing, according to Jane Pink “ *'uninvited' groups to the Conference who were anti-nuclear and stressed that the development of alternatives and conservation now could mean many more jobs at fractional cost, safety and with increased prospects of export trade*” (Pink 1976). Supporters of the picket included SERA (Stan Rosenthal spent the whole day there), Half Life, the Ecology Party, the Nuclear Reactor Vigilantes, London Greenpeace, the Young Liberals (Peter Hain is reported to have failed to make it at the last minute), CND, several local ConSoc groups, Dr. Schumacher, and Sir Kelvin Spencer <sup>50</sup> (Pink 1976).

While FoE concentrated on developing its 'insider' status and scientific credibility at 'elite' meetings, activists at ConSoc concentrated on building a wide ranging movement. As Beryl Kemp reported in March 1976 “*Action is being taken to coordinate the efforts of many anti-nuclear groups in the UK and plans are afoot for demonstrations, silent protests, marches. Later it is hoped to combine with European activities and world wide measures*” (ConSoc 1976c). ConSoc participated in the formation of three umbrella groups, NIN (the Nuclear Information Network), the Windscale Appeal and Energy 2000. They also concentrated their efforts on their 'Safe Energy' petition, and on publishing letters in leading papers. The Petition was modeled on the 'Clean Energy Petition' in the USA which had collected 400,000 signatures by July 1976. The aim of ConSoc's petition was “*to provide much needed evidence to the Energy Secretary that there is positive support for Safe Energy and opposition to Nuclear Power*” (CN65 1977). The petition was launched in early 1977, distributed widely even to Women's



Institute branches, and had obtained 20,000 signatures by September 1977 with a target of 30,000 by November and 50,000 by the New Year (Pink 1977).

ConSoc's proposed participation at the Windscale Inquiry and its anti-nuclear policies were opposed by some ConSoc members. Just before the Inquiry opened, A. C. Mason in the Letters column of Conservation News No. 65 denied the existence of a pro-nuclear lobby<sup>51</sup> in the UK and said "*we follow the lead of FoE on their out and out opposition to nuclear energy which is motivated by their experience of the American scene*" (Mason 1977). He was countered by three letters in the following issue (CN66) by Peter Dickson, D.C.B. Whittet, and Beryl Kemp, and also by Robin Homes in CN 69.

## 4.2 Windscale Appeal

The decision to hold a public inquiry was announced by Shore on 7 March 1977, but anti-nuclear groups meeting later that month failed to agree on a unified presence at the Inquiry under the banner of 'Windscale Appeal' (WA). As the ConSoc 1977 Annual Report commented (ConSoc 1977: 4):

*"The decision meant that the groups who had registered objections to the application had to decide on a plan of campaign and to this end an initial meeting was held at 9 Poland Street, attended by FoE, ConSoc, TCPA, CANTO, Civic Trust, Lawyers Ecology Group and others. It was not determined at this meeting whether legal representation was essential nor was there any certainty at that stage of sufficient money being available to fight the case. Agreement seemed to have been reached that the objectors should band together under the title of Windscale Appeal to avoid any one group's taking precedence. However, FoE intended to confine their evidence to the necessity for and the economics of the reprocessing plant itself, and also wished to be solely responsible for organizing the case".*

Nevertheless WA launched an appeal on 2 April for £30,000 to enable them to hire legal counsel and to defray other expenses involved in the expected three month long Inquiry. Some commentators, like The Guardian (15 April 1977), urged in an editorial that the issues were "*so significant in their implications that the main opposition groups should be financed from public funds*". FoE estimated that it needed a total of £26,000: £15,000 for legal costs and accommodation; £2,000 for solicitor's costs; £3,000 for witnesses, £3,000 for research staff; and £3,000 for travel, telephone costs and other incidentals. (Guardian 20 May 1977, cited in Boyle 1983: 37). Three weeks before the Inquiry it had raised less than a quarter of this, and FoE was eventually to spend £100,000 (Weston 1989: 54).<sup>52</sup>



The announcement on 2 May by Sir James Goldsmith (brother of Edward Goldsmith, editor of The Ecologist) that he and his business colleagues would contribute £25,000 to fund opposition groups at the Inquiry, created further controversy.<sup>53</sup> It was not made clear to whom, when and how the money would be paid, nor whether this was a firm commitment or a fund matching exercise. The result was that ‘intensive competitive lobbying’ between groups and the ‘souring of relationships’ (Wynne 1982: 102). As the TCPA commented at the NIN postmortem in November 1977 co-operation between groups was “*seriously damaged by the offer of funds and the attempt of various groups to get a great a share as possible*” (NIN 1977b). The division of his donation was a cause of great bitterness amongst groups. FoE got £10,000, a similar amount went to the Windscale Appeal, with £2,000 to the TCPA (who expected a great deal more), £2,000 to NNC and £1,000 to PERG (Guardian 1978: 23). The Windscale Appeal represented a wide variety of local and national groups. It consisted of CANTO, ConSoc, Cornwall Nuclear Alarm, the editorial group of The Ecologist, the Ecology Party, London Greenpeace, the Irish Conservation Society, the Society for Environmental Improvement and Wexford Nuclear Safety Committee. Most of these groups were part of NIN. Its committee, established ‘in an informal way’, was dominated by CANTO, out of its five members two were from CANTO (John Hanson and Edward Dawson), while Irene Coates represented both CANTO and ConSoc (as Convenor, Land Use and Planning Working Party), with Beryl Kemp representing ConSoc and Julian Boles London Greenpeace (ConSoc 1977: 4). As explained earlier (in 4.1.2) the presence of John Hanson who FoE distrusted, and who was considered by Wynne as having an ‘inability to co-operate’ with other groups meant that the WA was ostracised by other objectors (Wynne 1982: 102)

ConSoc believed that the Inquiry would be broad enough for it to be represented alongside other groups with disparate views, besides costing less than acting alone, saying “*(We) on the other hand, believed that the terms of the Inquiry would be wide enough to allow ConSoc to put forward its own arguments for alternative energy sources and no expansion of nuclear power*” (ConSoc 1977: 4). Irene Coates was appointed by the WA to co-ordinate the case and attend the Inquiry, but her position was made impossible by internal conflict, and as Wynne commented “*there was no clear executive to prepare a case and brief its QC*” with “*an approximately coherent case*” (Wynne 1982: 100). Her triple membership of CANTO, ConSoc and the WA undoubtedly led to conflicts of interest, and as the 1977 Annual Report of ConSoc stated “*It should be made clear that Irene Coates acted in this [the Inquiry] for the [WA] committee, rather than as a representative of the Conservation Society*” (ConSoc 1977). As a result ConSoc had only limited influence in formulating the case and in the choice of witnesses. As the



1977 Annual Report remarked *“even though the Conservation Society was by far the largest of the constituent bodies of the Windscale Appeal, we gained little publicity and our name was seldom mentioned”* (ConSoc 1977: 4).

WA costs were about £20,000, of which only £250 came from ConSoc. David Widdicombe, QC, assisted by Alan Alesbury, was engaged to represent them for a fee of £6,000, which he waived (Breach 1977i). WA presented evidence on the supposed need for nuclear power, its costs and risks, the disposal of nuclear wastes, the constraints imposed by the Euratom Treaty on the nuclear policies of the UK<sup>54</sup>, and on the greater use of district heating. Its witnesses in order were: John Davoll, Robert Blackith (Irish Conservation Society), Prof. Ivan Tolstoy, Norman Jenkins, Colin Sweet, Irene Coates, Dr. Barry Shorthouse, Prof. Gordon Atherley, Dr. Kit Pedler, Dr. Charles Wakstein, and Edward Goldsmith.

#### **4.2.1.1 Windscale Appeal Fiasco**

The WA’s evidence and witnesses were not well received by either the Inspector or the press, and ConSoc’s reputation suffered compared to FoE which rose. As the 1978 Annual Report commented *“(ConSoc) had only limited influence in formulating the case and choosing witnesses. By the end of the Inquiry, press comment on the proceedings had dwindled considerably, but reaction to the WA’s performance was not very enthusiastic”* (ConSoc 1978a: 5). Ian Breach covering the Inquiry for New Scientist, said that WA’s presentations had been disjointed and careless, though some of its witnesses had made able and credible submissions (Breach 1977i). Breach singled out the film presented by Charles Wakstein<sup>55</sup>, one of the WA witnesses, as a particular example of its *“misjudgments ... that beggar explanation”* (Breach 1977i). FoE’s case in contrast received praise from Breach, and the Inquiry *“marked a turning point”* for them. Reporting after the closing speech by its QC, Raymond Kidwell, Breach wrote *“No longer can FoE be regarded as an enterprising but rather unavailing conservationist lobby. After its case and this submission here, it will be seen as an important technical and political force”* (Breach 1977k). His report was full of praise for FoE’s conduct during the Inquiry, from its astute appointment of Raymond Kidwell as its QC, and Oliver Thorold as his junior, to its selection of issues and witnesses. Breach, after examining who had the ‘best’ case against THORP, concluded that *“On an overall balance of form, content, style and timing, though, FoE emerges as the cardinal adversary in these hearings”* (Breach 1977k).

The Guardian in its book on the Windscale Inquiry ranked the protestors efforts. Some it said (implicitly referring to FoE) *“had presented their evidence expertly, with speed and precision”*, while others *“have failed miserably to have any impact on the hearing, showing themselves to be clownish and misinformed”*. The Windscale Appeal it remarked *“should have been a*



*powerful voice at the inquiry. In fact the group has been weak and blundering*” (Guardian 1978: 88-89). Beryl Kemp, ConSoc representative on CANTO implicitly acknowledged this press when she wrote in ConSoc Newsletter in late 1977 *“Some of the evidence presented by the objectors has, unfortunately, been more emotional and alarmist than factual and though it may have made the headlines it has probably not influenced the Inspector- indeed it has tended to irritate him and discredit the environmental case”* (Kemp 1977).

The only favourable publicity for ConSoc was by Ian Breach, the former Press Officer of ConSoc. He commented favourably on submissions by John Davoll and Barry Shorthouse (Breach 1977i), and included Davoll’s evidence in full in his book *Windscale Fallout* in Chapter 10 entitled ‘A Conservationist’s Case’ (Breach 1978a). The WA only raised £14,000 towards its total cost of nearly £20,000. Of this over half came from Sir James Goldsmith, £2,000 from people for a Non-Nuclear Future, £1,000 from the Cheney Peace Settlement, but less than £3,000 from member groups of the WA (ConSoc 1979). At the end of the Inquiry it owed its solicitors nearly £5,000, and ConSoc (as part of the WA) was threatened with legal action for recovery of this debt. Eventually ConSoc settled the debt, but not without much internal recrimination between Irene Coates and Council members and overall regret at the ‘fiasco’ of their involvement with the WA.<sup>56</sup>

### **4.3 Windscale aftermath**

The Windscale Inspector’s report by Justice Parker was presented to Peter Shore on 26 January 1978. At first it appeared that the report would not be published, despite Parker’s wishes, before the Cabinet had reached a decision, and this lack of public debate caused alarm (Bugler 1978b). Ian Breach in an editorial in the New Scientist said of Shore (Breach 1978b):

*“Technically, he is within his rights. Tactically, he is acting unwisely... the environmentalist lobby is morally justified in demanding that the Parker Report ...be seen and considered by more than a handful of ministers, senior civil servants, and possibly some of those with a vested political interest in the application”.*

There were appeals by MPs to Tony Benn, known for his views on open and responsive government, to exert his influence, and this together with lobbying from environmentalists ensured that the Report was finally published on 6 March 1978. Parker recommended that outline planning permission for THORP should be granted to BNFL ‘without delay’. Shore, introducing the report to the House of Commons on 6 March, found the Report’s conclusions *“persuasive and broadly acceptable”* and that he would normally have gone ahead to grant permission to BNFL (Breach 1978c: 635). However he wished to give the House of Commons the opportunity to debate ‘this unique set of issues’. A Parliamentary debate was held on the 22



March, and after 6 hours of debate, the House voted by 186 votes to 56 in favour of THORP (Boyle 1983: 58). There was another debate on 15 May on a Special Development Order (Shore's procedural stratagem for allowing Parliamentary debate<sup>7</sup>) permitting THORP to go ahead, this was approved by 224 votes to 80 (Bugler 1978b). Parliamentary scrutiny was considered very lacking, with Wynne remarking that MPs were “*ritual rubber-stamping, given the lack of time for proper briefing*” (Wynne 1978b: 351).

#### 4.3.1 Reaction to the Parker Report

The contents of the Parker Report took most of the participants to the Inquiry by surprise. According to Michael Kenward - news editor of New Scientist - BNFL's opponents were staggered by the inspector's uncompromising acceptance of the case for expansion, while the company seemed equally amazed that its plans had come through almost unscathed. He quotes Walt Patterson as saying “*I didn't realize how fundamentally Parker was inclined to reject our line*” as during the Inquiry Patterson had the impression that Parker had understood the arguments on both sides (Kenward 1978). Ian Breach in the New Scientist, reflecting Patterson's views, wrote that there would be dismay and even anger from those who were expecting “*a report that would, as near as realistically possible, reflect the detail and the character of their case ...the report fails to do this and more seriously, misrepresents views and obfuscates or distorts the context in which those views were tended to the inquiry*” (Breach 1978c). Breach singles out as evidence of misrepresentation the treatment of two principal witnesses, Brian Wynne and Peter Taylor, most of whose evidence is not cited. Another commentator, Jeremy Bugler called it more a polemic than a report and that seldom was there an “*inquiry report that cared so little for the appearance of even-handedness*” (Bugler 1978a). Parker, he wrote, by oversimplification of the issues, ended “*up by muddying the water*”, and it would not be surprising if the anti-nuclear movement now changes its approach (Bugler 1978a).

##### 4.3.1.1 FoE reaction

The Parker Report was a bitter blow to FoE, who had high hopes for their case based on what they saw as their intellectual rigour and the perceived respect given to their case by Justice Parker. As Lamb, the FoE biographer remarked “*The judge seemed to have understood their arguments and Patterson was optimistic about the chances of a win*” (Lamb 1996: 87). Patterson remarked much later (1985: 126):

“*Those like Friends of the Earth who had come away from the inquiry itself feeling that they had made a strong case, and that Parker had taken it on board, could find in the ninety-nine terse pages of the Parker Report no sign of their case whatever. Their arguments had not been refuted so much as simply ignored*”.

Commenting nearly two decades after the Inquiry, Patterson recollects that the *“Windscale Report was the worst experience of my life, Parker kicked us in the balls”* (Patterson 1996). Patterson however still believes that the Inquiry would have been won by FoE, if other groups had not been involved and ‘muddied the waters’ with their evidence, allowing *“Parker to discredit our evidence.”* (Patterson 1998). As he commented in an earlier interview (Patterson 1996):

*“I remain convinced that if it was just us versus BNFL at the Inquiry, it would not have gone ahead. But other environment groups got on the (anti-nuclear) bandwagon and presented a total mish-mash of arguments. There was a smoke-screen of amorphous arguments, Parker could pick and choose, and tarred us with the same brush as the lunatic fringe”.*

Patterson believed that Parker understood their evidence but when it came to writing his report he 'lost his brains' and that *“it was complete travesty of our case. It was a great shock when we lost... we were naive to believe our case would be considered on its merits. But we had to oppose it and to take part”* (Patterson 1998).

Czech Conroy, the leader of the FoE campaign was stunned by the treatment of their case. As he confided to Lamb (1996: 87):

*“I thought the odds were stacked against us at the beginning... but we put together a very credible case. By the time that the inquiry ended. I reckoned our chances of victory at about fifty-fifty... What really stunned me was the incredible one-sided nature of the report. We had really believed that our ideas would be accurately represented and objectively considered - even if the final judgement went against us”.*

As Tom Burke, Director of FoE at that time, remembered (Burke 1996):

*“We believed we had a coherent case to put. We thought winning the argument would carry the day. This belief ended with the Parker Report. The Parker presentation of our case was a travesty, we were shafted. We felt a sense of betrayal and our confidence was shattered, it produced deep and lasting disillusionment”.*

Mike Flood, another of the FoE staff involved with the anti-nuclear campaign from its early days, commented in 1996, that the Parker Report had *“made me very angry, as our logical arguments were dismissed. We weren't expecting to win, but we had to take part as FoE had lobbied for an Inquiry”* (Flood 1996). Flood believed that an important aspect of the Inquiry was that *“We were gaining a platform for our views and our views were treated with respect, while their arguments were falling apart”* and above all *“FoE was very interested in getting the facts straight.”* (Flood 1996).



The Parker Report was not only a dismissal of FoE's evidence but also, more severely, called into question their strategy of protest based on expertise. As Patterson wrote some years later, the Parker Report "*shattered any illusions about the force of rational argument on nuclear issues... the report proved to be a numbing dismissal of every opposition argument, and could have been written without even holding the inquiry*" (Patterson 1985: 151). Writing three years later in 1981, Bugler accused FoE of being politically naive at Windscale saying FoE failed "*to realise that it was going before a hostile bench*". As Bugler recollected (1981: 295):

*"I still have fresh in my mind the winded astonishment of the members of the Friends when they heard the news of the Parker Report. They were like men who had been asked to speak at a meeting for a Worthy Cause and found that while they were doing so, someone had picked their pockets".*

He contrasted their optimism with 'more worldly-wise environmentalists' who had "*rumbled Parker even while he was taking evidence*". Bugler put the failure of FoE down to its belief in working within the political system, saying "*this naivete is accompanied by a commitment to politicking, ...by a march-them-up-the-hill belief in the political system and the trustworthiness of Whitehall*" (Bugler 1981: 296). Robin Grove-White, who was active in the anti-nuclear campaign but in his terms only 'very peripheral' to the Windscale Inquiry, believes that the Inquiry was a turning point for FoE. Nearly two decades after the event he judged that "*FoE had run a brilliant campaign and they were devastated by the result. They thought they had won the arguments. I knew FoE hadn't done as well as they thought they had... maybe I was wiser in the ways of the world*" (Grove-White 1996). Grove-White was more experienced, and perhaps more cynical, about public inquiries, and thus was not surprised by the result. His longer experience, dating back to 1971 to the campaign against the proposed Shell oil terminal in Anglesey and from his work with CPRE, meant that he better understood the planning system. As he remarked in 1996 on the shock of Inquiry result and its impact on FoE "*I was prepared for it but this was the first inquiry for them. Several witnesses wrote to the Times saying their evidence was travestied in the Parker Report but I couldn't take it seriously, I just thought this man is a bigot*" (Grove-White 1996). He concluded on FoE naivete, saying "*FoE was flummoxed, they were innocent, they were full of terrific energy and fun, and felt it was a bit of an adventure. It was quite an adjustment afterwards*" (Grove-White 1996).

FoE published in April 1978 a bitter critique called *The Parker Inquiry*<sup>38</sup>, detailing the inadequacy of the official report, which was presented to Shore the day before their demo (see 4.3.2). They accusing Parker of being biased in favour of the nuclear industry's plans, and of being selective in his use of evidence. While the Inquiry had set "*a landmark in nuclear policy*



making”, its “*hasty and erratic judgements*” had produced a “*polarisation rather than a moderation of the debate*” (NS 1976c). Thus FoE concluded the Report had made it more difficult to see how public confidence in the worth of participation in such lengthy and costly procedures can easily be restored or in Patterson’s simple words “*The Parker Report polarized the nuclear issue in the UK essentially beyond any hope of recovery*” (1985: 151).

#### 4.3.1.2 ConSoc reaction

ConSoc was not so disillusioned, not having such high hopes about their evidence and seeing the Windscale Inquiry as no more “*than a rehearsal for the now-promised Inquiry into the first commercial fast breeder reactor*” (Coates 1978). As Beryl Kemp remarked “*We lick our wounds and prepare for the Fast Reactor Inquiry*” and that “*It makes depressing reading for environmentalists because the Inspector has failed completely to understand the real issues at stake*” and that Parker was “*sceptical and dismissive of any optimistic claims by the objectors of the ability of conservation and alternative energy systems to meet the energy gap should it arise*” (Kemp 1978: 9).

The Parker Report however won approval from some members of ConSoc, lead by John Fremlin, for its lack of bias. In letter to Conservation News in the summer of 1978 he defended the impartiality and expertise of the two assessors<sup>59</sup> at the Inquiry, saying “*It is the bias of ignorance that worries me. Well meaning ignorance is defenceless when faced with propaganda*” (Fremlin 1978a). In the following issue (No. 70) in the autumn of 1977 there were two replies to Fremlin’s letter from Mrs. H. M. Derrick and Beryl Kemp and also a rejoinder from Fremlin. Kemp defended her use of the word ‘bias’ meaning “*leaning*” (not *prejudice*)” while Fremlin compared the efforts of the nuclear lobby to that of the coal or oil lobby (Kemp 1978b). Fremlin, commenting on Ralph Nader’s actions in stopping nuclear power stations in the USA, which had lead to more fossil fuel being sold, wrote “*I don’t suppose for a moment that Ralph Nader was himself paid by the oil companies or that anyone, or any organisation, in Britain has been paid by them. Why should they pay for propaganda when a whole lot of well-meaning people will do it for them for free?*” (original emphasis) (Fremlin 1978b).

There was a chorus of criticism in much of the mainstream press about the Parker Report, with many witnesses feeling that their evidence had been totally ignored. However despite the widely perceived faults in the Parker Report, the failure for the objectors to get their views across to Mr. Justice Parker was to some extent self-inflicted due to the often poor quality of their evidence.<sup>60</sup> As The Guardian book commented “*the objectors will probably all agree they could have performed better if they had kept their attack short, sharp, free from obscure meanderings, and*



*most important of all, not been so numerous*” (Guardian 1978: 89). Ian Breach in a NS editorial in November 1977, after the end of the Inquiry, argued that the Inquiry format was partly to blame for the end result being ‘unmanageably large and inchoate’. While many of the submissions were powerful and credibly articulated, their cases were “*damaged by the rambling, shambling and repetitious format in which they found themselves*” (Breach 1977l). Writing some months after THORP had been approved Breach was less optimistic believing that the environmentalists had failed their first major test at Windscale (1978e: 260). However he was hopeful that their coherent arguments - largely put forward by FoE- had been sufficient to ‘frighten government’. Wynne was also positive about the outcome of the Inquiry saying that “*despite the unambiguous repudiation handed out by Parker, objector groups enjoy greater credibility and influence than ever before*” (Wynne 1978b: 351). Furthermore he believed that “*the information it has exposed and expectations it has stimulated have percolated into the entrenched perspectives of the nuclear opposition and will, no doubt, provide fuel for further, if more refined, controversy*”. Thus the Inquiry has “*promoted opposition rather than reassured and diminished it*” (Wynne 1978b: 351).

However Breach in his book on the Inquiry, *Windscale Fallout* - reviewed by Wynne (1978c)- was more pessimistic “*The politics of nuclear power and reprocessing will increasingly be those of disillusion, anger, frustration and mistrust. We shall all be the losers*” (1978a: 181). The Inquiry also established FoE’s leadership of the anti-nuclear movement with the media. As Martin Ince, a freelance journalist, remarked in Undercurrents “*One thing that Parker’s Inquiry proves is that nuclear opposition in Britain is Friends of the Earth*” (Ince 1978).

#### **4.3.2 FoE Demo**

The Parker report dealt a severe blow to FoE’s pride and anti-nuclear strategy based on lobbying and debate. In early 1978 they decided on a change in tactics and called for a mass demonstration in London for Sunday 19 March. As UC in its events column sarcastically remarked “*FoE a group hitherto more noted for its high level lobbying, is organising a meeting in London’s Trafalgar Square*” (Undercurrents 1978a). The meeting, now termed the ‘Stop Windscale’ march, was postponed until Saturday 29th April, following a two-month ban on marches in London (Undercurrents 1978b). This march was, according to UC, part of FoE’s three pronged attack following the Windscale Inquiry. The first two activities, publication and lobbying were staple FoE tactics, it was the third which was novel. Firstly the book *What Choice Windscale* by Czech Conroy published jointly with the Conservation Society in January 1978 which contained a history of the anti-nuclear campaign (emphasizing FoE record) and a summary of the arguments against reprocessing. Secondly pushing through MPs and the press



for publication of the Parker report before any Government decisions. And thirdly *“organizing the London demonstration as an indication of the strength of public opinion”* (Undercurrents 1978b).

The march on Saturday 29 April 1978 was well attended, and was by far the largest anti-nuclear power demonstration seen in Britain. Before the event UC expected 10,000 people to attend, and in the next issue they reported that a crowd of more than 10,000 *“have voted with their feet in answer to Mr. Justice Parker’s contemptuous dismissal of their case at the Windscale”*

(Undercurrents 1978c). According to the accounts in UC and Vole (1978b) it was the new, more militant, voices speaking out in support of non-violent civil disobedience that drew the crowd’s approval not the message of continued conventional protest from Tom Burke of FoE and John Davoll of ConSoc. Undercurrents reported (1978c):

*“The mood of the demonstrators who packed Trafalgar Square was probably best captured by Arthur Scargill, the Yorkshire Miners president, who told the crowd “if it needs civil disobedience to stop nuclear power, then we shall have to have civil disobedience” words which were greeted by the loudest cheers of the afternoon (though the Master of Ceremonies for the day, FoE Director Tom Burke, was seen to shudder visibly as the words ‘civil disobedience’ were uttered”.*

The crowd was urged to contemplate picketing and occupation of nuclear facilities if the Windscale expansion was sanctioned by Parliament and existing plans for nuclear-powered generation were continued (Breach 1978a: 189). Calls for direct action worried some commentators, with Kenward in an pre-demonstration editorial in New Scientist warning against the ‘Eco fascism’ of anti-nuclear extremists who *“wanted to go to any length to bring a halt to nuclear power in Britain”* (Kenward 1978).

#### **4.3.3 Call for direct action**

The call for a more radical approach than that adopted by FoE or ConSoc had been made for some time by local activists and by the movement press, such as Peace News and SCRAM Energy Bulletin. It was further reinforced by FoE’s failure at Windscale and adverse comment about groups working ‘within the system’. As Wynne remarked in a review of future anti-nuclear tactics *“Disillusioned with the rough treatment meted out by Parker, FoE and others are beset by considerable internal conflicts as to whether the streets are not a better political forum than the committee room”* (Wynne 1978b: 351). Furthermore he commented that *“FoE’s members have been highly critical of their leadership’s moderate line and its attention to lasting credibility with the establishment”*. There were fears that participation in the widely expected



Fast Breeder (CFR-1) Inquiry would lead to a similar defeat. In an article in the New Statesman in March 1978 Jeremy Bugler wrote (1978a: 310):

*“...until now the anti-nuclear forces in Britain have shown themselves willing to protest ‘within the system’. In sharp contrast to French and German opponents, they have argued that society can be persuaded from nuclear power. But Parker does not offer dialogue... it will not be surprising if the anti-nuclear movement here now changes its approach”.*

Dave Elliott, active in SERA and in mobilizing trade unions for the anti-nuclear campaign, agreed saying *“The case for more effective, direct action through civil disobedience has never been stronger”* (Elliott 1978b). In an article in Undercurrents in the summer of 1978, assessing the pros and cons of participating in the expected CFR-1 Inquiry, he wrote that participating in an Inquiry did have tactical advantages, in terms of gaining publicity for counter arguments. However Elliott commented *“It seems likely that just as at Windscale wider arguments will be listened to, but sidestepped ...no amount of technical argumentation seems likely to influence the official decision makers”* (Elliott 1978b). He thus proposed an intermediate strategy, combining limited participation in Inquiries with *“careful grass roots organizing in the community as a whole”*. He believed ‘direct action’ would not stop the construction of reactors, but their value was that they *“are mainly ‘public relations’ activities, aimed at demonstrating the strength and commitment of the movement, and thereby putting pressure on the decision makers”* (Elliott 1978b).

In response to Elliott’s article David Pearce, who was conducting the Windscale Assessment and Review Project (see Breach 1978d), wrote to Undercurrents entering *“a brief plea for giving the establishment one more chance”* with the proposed fast breeder (CDFR-1) Inquiry, due to take place in 1979 (Pearce 1978). He argued that a inquiry was an important means of soliciting information, *“and that much can be done with this information which may be surprising in terms of the results it yields”*. Pearce’s worry was that if this inquiry was boycotted *“an opportunity for generating valuable information through a quasi-adversial process is missed”*, and the ‘don’t knows’ in the public would not be able to be informed (Pearce 1978).<sup>61</sup>

In a major review in July 1978 of anti-nuclear tactics post Windscale, Ian Breach commented *“the existing environmentalist movement faces its most difficult period, in Britain, over the coming debate on fast-breeder development. If they lose their case against the FBR, their chance of widening and popularising their concerns will dwindle. Knowing this the government could pull the rug from beneath their feet”* (Breach 1978e: 260). Breach urged the centre-left environmentalists to build a much broader based movement, including the *“unemployed, the deskilled, the homeless, the aged poor, racial minorities and others”* through working with such



groups as *“Age Concern, the Lucas Aerospace Combine Shop Stewards' Committee, the Claimants Union and the Conservation Society”* (Breach 1978e: 260). Elliott too was in favour of a broad based movement writing *“The task now is to start to build a broad, but politically aware, anti-nuclear movement, which steers between co-option and manipulation by meaningless government inquiries on the one hand, and over zealous, adventurist, direct action on the other”* (Elliott 1978b). While Breach and Elliott, and many other activists pondered on how to build a broad based anti-nuclear movement, Wynne was wondering about the opposite *“It may be that movements with political interests ‘extraneous’ to the nuclear debate will now exploit the gap between leadership and members to raise wider issues and to recruit anti-nuclear protestors to their politics”* (Wynne 1978b: 351).

This ‘broad-based’ strategy was to be put to the test over the next year at the Torness site in Scotland. Here a peaceful ‘occupation’ of the site in early May 1978 by several thousand people was followed later in the year by ‘direct action’ in the form of physical attempts to obstruct building work and the squatting of a cottage on the site scheduled for demolition (for details see Welsh 2000). The election of the Thatcher government in 1979, and its commitment to nuclear power, further diminished the appeal of the measured FoE approach to activists. As an impassioned editorial in the New Scientist - most probably written by Ian Breach- said *“environmentalist appeal to their version of good sense, to rationality, to good husbandry on planet earth, and so on are falling on deaf ears: those with access to the levers of power are not always swayed by rational debate”* (NS 1979). The editorial therefore welcomed the creation of the Anti-Nuclear Campaign (ANC) *“that could become more influential and more decisive in British politics than any other since the suffragettes”*. However this (anti-FoE) view was challenged in another New Scientist editorial warning of the rejection of sensible criticism in favour of ‘guerilla’ activity, and that there was *“plenty of room for technically informed critics who may not be winning the war, but are winning some battles”* (Kenward 1979).

#### **4.3.3.1 Greenpeace: the winners**

The main beneficiaries of this more militant mood was not the existing anti-nuclear movement, nor established environmental groups but Greenpeace. This new organization was from the late 1970s able to win vast publicity and thousands of members by *“its uncompromising emotive appeal to popular sentiment, combined with non-violent guerilla tactics”* (Lamb 1996: 87). As Harold Bolter comments on the anti-nuclear opposition post Windscale Inquiry (Bolter 1996:178):

*“.... FoE anti-nuclear campaigners lost heart. Many of their natural supporters began to look for something more telling than the reasoned arguments against nuclear power and*



*reprocessing provided by Tom Burke and Walt Patterson. They were ready for action - and Greenpeace stepped in and gave them what they wanted. Argument was quickly replaced by anger and aggression”.*

This anger and aggression was to be harnessed by new organizations such as the Anti-Nuclear Campaign which from 1979 was to protest against both nuclear weapons and nuclear reactors, thus directly linking the peace and the environment movements. Thus I consider the year 1979 to be the end of the 1970s anti-nuclear campaign and of the time period covered by this thesis. In the following three chapters I examine the anti-nuclear power movement in greater detail, seeking to establish the background or ‘identity’ of these protesters, their motives and their influences.

## **5. The Environmental Universe: Boundaries and Explanations**

The second part of this thesis - Chapters 5 to 7- analyses the events in the first Part, seeking to explain who were these anti-nuclear activists and why they chose to protest about nuclear power. As Walt Patterson so aptly put, it in his first account of the British anti-nuclear movement, *"What is an 'environmentalist', and what is it about nuclear power which arouses 'environmental' attention and concern?"* (Patterson 1979: 158). It is the aim of Chapters 5-7 to discuss these questions in greater depth, than he was able to, by looking at recent academic work on the anti-nuclear power movement. This chapter, drawing on the experiences of two activists Joe Weston (1989) and Derek Wall (1999), explores the ideas and concepts behind the academic analysis of the anti-nuclear and environmental movements. It first discusses what is an 'environmentalist' and what triggers people to become one by looking at the cause of the 'green commitment' (Hay 2002). Next it outlines theoretical work on 'social movements' and the role of 'movement intellectuals'. It then asks why do people become activists and join groups; is it for men some kind of 'ethical hobby'? It notes the neglect of the important role of women activists in most historical accounts. In the final section it examines the nature and background of the 1970s 'environment movement' and illustrates how existing activists are recruited into new groups, such as Friends of the Earth (FoE), and how these new groups establish their identity through new styles of protest or 'repertoires of action', in this case the Schweppes bottle dump in 1971.

### **5.1.1 What is an 'environmentalist'?**

An 'environmentalist' is commonly understood to be someone concerned about the 'environment' but that term is open to much dispute. One dictionary defines 'environment' as *"A combination of the various physical and biological elements that effect the life of an organism"* but goes on to remark that although it is common to refer to 'the' environment, there are in fact many environments, all capable of change in time and place (Kemp 1998:127). Another dictionary says it *"includes social, cultural, and (for humans) economic and political considerations"* (Allaby 1994: 138). Put simply, it may be considered as the interaction of human beings with their 'surroundings'. Its meaning has evolved away from one which assumed that human beings were separate from nature, though surrounded by it, towards one which assumes that human beings are a part of nature and that human society is dependent on physical and biological processes for its continued existence (Silverton and Sarre 1990: 3). The term 'environmentalist' and 'ecologist', meaning someone who was concerned about and worked for the protection of their environment, only came into usage about 1970, reflecting the



use of these words by government and magazines in their titles.<sup>62</sup> These two terms had previously been restricted to academic psychology and biology respectively. People initially called themselves ‘eco-activists’ (as in the title of Allaby’s 1971 book) but by the early 1970s most popular paperbacks used the word ‘environment’, or ‘environmental’ in their titles, and hence the usage of the terms ‘environmentalists’ or ‘environment movement’.

What is interesting to note is the change in language, and perception of this opposition, by the media that occurred in the early 1970s. For example in 1970 The Times in the article on the success of the opposition to the planned Stourport reactor talked in traditional terms of the ‘countryside lobby’ and ‘rural conservationists’ but a few days later it referred to ‘an important environmental victory’ (Times 1970). This seems to indicate that some writers for The Times realized that opposition went beyond traditional concerns with countryside matters to embrace a new set of concerns, as yet unarticulated, labeled ‘environmental’. This term ‘environmental’ was very recent, certainly given publicity with the founding of the Department of the Environment in 1970. If there were activists they generally called themselves ‘ecologists’ rather than ‘environmentalists’.

By the 1980s the term ‘environmentalist’ had swept all previous rival terms aside, like ecologist or conservationist, and established its meaning as “*One who holds that damage to the natural environment resulting from human activity is so severe as to present a challenge to the survival of many habitats and ultimately perhaps to the continuance of life on earth, and can be addressed only by major reforms of the way people live and industries function*” (Allaby 1994: 138).

## 5.2 The Environmental Impulse

Why do only a minority of people who say (according to opinion polls) they care about the environment, become activists? Why do most remain passive? What is it that galvanizes certain people to do something? These questions are the staple of most academics who seek to explain the rise of the environmental movement, and the explanations vary according to the discipline of the writer. Political analysts talk about it in terms of ‘opportunity structures’ in political discourse (Kitschelt 1986; Tarrow 1994; Wall 1999: 116), and sociologists ascribe it to the rise of ‘new social movements’ due to changes in society (Della Porter and Diani 1999; Doherty et al 2000: 9-15). One widely subscribed view is that a change in values away from ‘materialist’ towards ‘post material’ ones in the 1960s explained people’s interest in ecological issues (Inglehart 1977; 1990; Cotgrove 1982) and was the cause of anti-nuclear attitudes (Wellock 1998). Others ascribe it to the reality of worsening post-war environmental conditions, particularly air and water pollution caused by new technologies (Commoner 1966).

### 5.2.1 Value based

The argument for a change in values as a cause of environmental participation rest on the idea that as people get richer they can afford to do something about a polluted environment. The rich it is claimed have different desires and aspirations from the poor, who it is argued are willing to put up with (and generally ignore) pollution and a low quality environment for the sake of jobs and prospects of material possessions, a view which is being challenged by the 'environmental justice' movement.<sup>63</sup>

This material view is endorsed however by Samuel Hays, the veteran US environmental historian, when he wrote "*At root environmental affairs in modern life are a combination of changes in values and environmental circumstance*" (Hays 2000: 24). These new values, he argues, come from increasing post-war affluence and the willingness to pay for a clean environment. However the cause of these values is experiencing concrete examples of environmental degradation in every day life, like pollution, the destruction of natural resources, and over crowding.

Thus there can be seen an element of material (or vested) self interest in this campaign to 'clean up the environment', which attracted criticism from the Left during the 1960s and 1970s. This concern for environmental issues as class based was articulated famously by Anthony Crosland in a speech in 1970. Speaking of sections of the conservation lobby he said "*Their approach is hostile to growth and indifferent to the needs of ordinary people. It has a manifest class bias and reflects a set of middle- and upper-class value judgements [for which] preservation of the status quo is the sole consideration*" (quoted in Lowe and Goyder 1983: 10).

That most members of environmental groups (in the 1970s) were middle class is incontestable (Lowe and Goyder 1983: 10-11), and sociologists in the 1970s saw environmental activism as the product of the emergence of a 'new class' which attempts, via environmental protest, to gain improved social status and greater economic power (Gouldner 1979; Kitschelt 1985: 278).

However 'new class' explanations have been criticised as neither 'new' nor economically motivated (Martell 1994: 130). This idea of a 'new class', based on middle-class professionals working in the service sectors and remote from production, has been used to explain opposition to nuclear power (Cotgrove 1982).

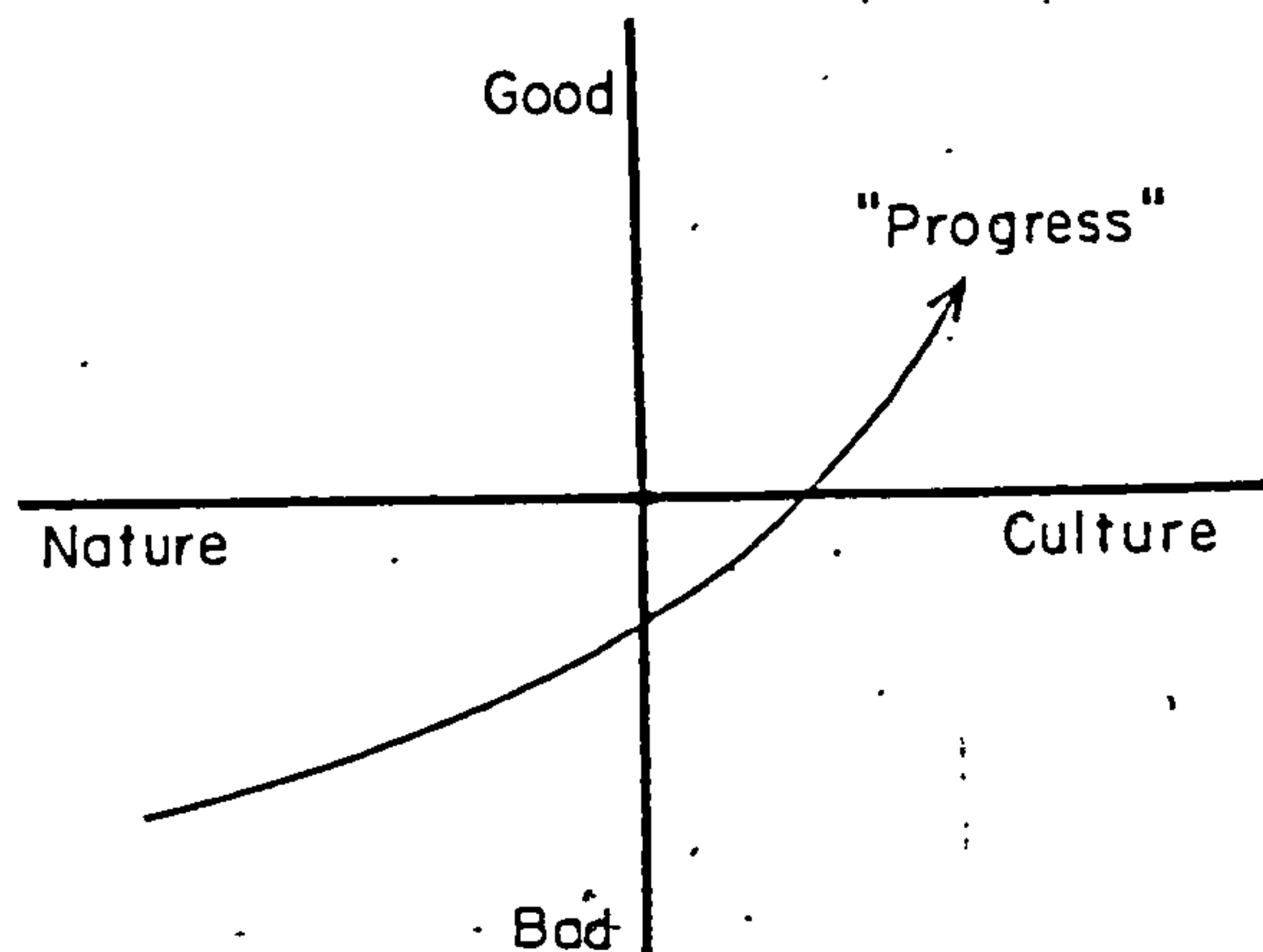
Undoubtedly many of those involved in anti-nuclear protest were members of the 'new class' but, as it has been pointed out, better educated social factions find it easier to become active than do other elements of a population (Steinmetz 1994: 183). Also 'new class' professionals because of their media skills can become influential people in movements, and such people can play a 'leadership role' in a wide range of social movements: new, radical, reactionary or otherwise (Bagguley 1992: 27).



### 5.2.2 Attitudes to nature

The key driver to environmental participation may be attitudes towards the protection of nature. Lowe attributes the Victorian concern for wildlife protection as stemming from two powerful 'intellectual currents' "*the strong enthusiasm for natural history; and the crusade against cruelty to animal*" (Lowe 1983: 329). It was then that the first animal protection and nature preservation groups emerged: the Society for the Protection of Animals in 1824 and the Commons Preservation Society in 1865. Underlying the founding of all the groups devoted to the protection of 'nature' was a fundamental dispute about the future direction of society which rested on attitudes to nature versus culture (see Figure 5.1). In Western thought this grew into polarities such as countryside versus city or wilderness versus civilization (Weart 1988: 354). The contrast between wilderness and civilization implied a contrast between wild and controlled things, and in personal terms nature was often associated with intimacy rather than formality, with instinctive, 'natural' impulses rather than self-control and planning and, in brief, with feelings as opposed to logic.

Figure 5.1 Scheme of ideas, common in modern thinking, distinguishing nature from culture. Either extreme could be seen as good, bad or a mixture. In the lower left of the diagram we would find the old view of wilderness as a thorny forest full of wolves and demons, in the upper left an unspoiled fruitful Arcadia; in the upper right, an orderly utopian White City; and in the lower right, a robotic slave state. The traditional arrow of 'progress' or economic growth is shown as an ideology of replacing lawless wilderness with beneficent civilization. Opposition to this view of 'progress' was at the core of antinuclear ideology.



Source: Weart 1988: 355.

These patterns of association have become so pervasive in Western thought that, as Weart remarked, most people took it for granted "*Nature was to culture as wilderness was to civilization, wild to self-controlled, victim to authority, feelings to logic, and female to male, not to mention liberty to order, freedom to security, Dionysian to Apollonian, organic to mechanical, 'soft' to 'hard' and so forth indefinitely*" (Weart 1988: 355). These associations carried a scale of values, generally nature and culture were seen as equally capable of good or bad, and the ideal state was envisaged as the harmony of human activity (or civilization) with the natural environment. However another way of thinking, that of mastery and control of nature,

has also been long dominant with man's duty to transform the useless disorder of desert and forest into an organized landscape. By the 19th century this idea of 'progress' was universally identified with the growth of science, industry, and social order, but was increasingly criticised by intellectuals who began to praise untouched wilderness along with spontaneity and freedom. This association of nature with feelings and emotions, rather than intellect is implicit in the ideas of Peter Hay, a green philosopher, who believes that environmental participation, or what he calls a 'green commitment' is not derived from a theoretical, or even rational perspective. He argues that this 'green commitment', or what he calls the 'ecological impulse', is due to an instinctive ecological compassion often caused by 'some trigger or impulse'. He wrote "*the wellsprings of a green commitment- at both the activist and more passive levels of identification- are not, in the first instance, theoretical; nor even intellectual. They are, rather, 'pre-rational'*" (Hay 2002: 2). Hay describes this 'pre-rational impulse' as a "*deep-felt consternation at the scale of natural destruction wrought ...upon the increasingly embattled lifeforms with which we share the planet*" (Hay 2002: 3).

This instinctual and deep-felt horror at the destruction of nature as a cause of 'green commitment' is also expressed by other writers, such as Holmes Rolston who wrote about "*the maelstrom of killing and insensitivity to forms of life*" (Rolston 1985: 720). Thus to Hay "*the obliteration of once-abundant life seems to be the most potent greening agent*" (Hay 2002: 4). This observation of the importance of the massacre of wildlife to participation is borne out by the historical record on the founding of conservation groups specifically devoted to the preservation of fauna and flora. One of the earliest campaigns was against the shooting of seabirds at Flamborough Head which lead to the passing of the Sea Birds Preservation Act of 1869 (Sheail 1976: 22-24).<sup>64</sup>

The environmental movement has always been campaign led, a popular response to an assault upon people's lives, as through pollution, or the destruction of nature, and the early campaigns against nuclear power stations reflected this. In the 1950s and 1960s this opposition was labeled, by the press and inquiry inspectors, as concerned with inherently class based and distinctive 'amenity' issues. According to Welsh this labeling reflected the fact that 'amenity' was a familiar category of dissent and "*In the prevailing discourses of the day 'amenity' had a similar connotation to NIMBY in more recent times*" (Welsh 2000: 70). For instance at Bradwell in 1956, the main opposition group, the BDPPA, nominally reflected two sets of organized local interests centred around the oyster industry and local sailing enthusiasts. But it also acted as a focus around "*which a much more diverse and less clearly focused range of objections coalesced*", many from outside the local area (Welsh 2000: 73).



These objections, often based on ethical and moral principles, were seldom articulated at Inquiries. One person who was prepared to do so was Max Nicholson, the Director General of Nature Conservancy, an organization set up by the Government in 1949 to protect wildlife sites. In his evidence to the Dungeness Inquiry in 1958, Nicholson argued for the primacy of nature conservation over short term economic interests, and said there was an inherent conflict in national goals: *“we wanted economic development and a higher standard of living but we also wanted to leave something of our inheritance to our children”* (Times 1958c).

These ethical goals and objections against nuclear power were developed in the 1960s by Fritz Schumacher, who concluded in his book *Small is Beautiful* (1973a: 135):

*“No degree of prosperity could justify the accumulation of large amounts of highly toxic substances which nobody knows how to make 'safe' and which remain an incalculable danger to the whole of creation for historical or even geological ages. To do such a thing is a transgression against life itself, a transgression infinitely more serious than any crime ever perpetrated by man. The idea that civilisation could sustain itself on the basis of such a transgression is an ethical, spiritual and metaphysical monstrosity”.*

Schumacher's ideals were to inspire a generation of anti-nuclear activists and his book as a critique of industrialism was to have an enormous impact on the emerging environmental movement (Veldman 1988: 296-299). This movement had many strands, from conservative to revolutionary, and as a journalist remarked in 1973 (New Statesman 1973: 148):

*“The main strength of the movement is in fact in its diversity. It is the people who react spontaneously to protest some specific exploitation of their own areas or disruption of their lives who are forcing the political establishment to take environmentalism seriously, and continuing to challenge ideas which until recently were taken for granted: the dominance of man over nature, and the inexorable progress of technology”.*

### 5.2.3 Triggers

Samuel Hays believes that an important factor in the growth of the environmental movement was people experiencing areas of outstanding natural beauty like in National Parks, which was due to post war growth in leisure opportunities and motoring holidays. Hays believed that more people become engaged with political action through this tourism than by reading Henry Thoreau or John Muir - although these may come later as people search for wider meaning and explanation (Hays 2000: 24).

Hays views are echoed by Adam Rome in his study of the impact of post war US suburban sprawl. He argues that the desire to preserve wilderness areas, like Echo Park in the early 1950s, ‘was the tip of an iceberg’ and that far more influential to people was the environmental

consequences of suburban development (Rome 2001: 8). He wrote *“Again and again, the destruction of nearby open spaces robbed children of beloved places to play- and the losses hit home more vitally than the threats to far off sites like Echo Park ever could”* (Rome 2001:8).

The conservationist W. M. Adams similarly argues that the sense of lost nature, and feelings of helplessness in the face of vast forces for change, are powerful stimuli for conservation (1996: 78). He believed that concern at change in particular places, or the destruction of particular individual creatures, can prove radicalizing and gives an example for his childhood.

He wrote *“I can recall one particular event in my childhood that stands out for its effect on my attitudes to nature, and to the ways people used and abused it”* which was the cutting down of row of flowering red chestnut trees next to his home to make way for new houses (Adams 1996: 78). He remarked that *“to me this was a symbol, a worked example, of humanity at its most outrageous: greedy, selfish, thoughtless and uncaring. In time this experience, and doubtless many others now lost to mind, turned me from being simply someone who like birds and bugs into a conservationist”* (Adams 1996: 78).

Similar experiences were found by Derek Wall in his interviews with Earth First! activists, with many of them saying that they had been influenced into green activism by their childhood experiences of the destruction of the countryside. As Wall observed *“transgression of a place cherished in a childhood memory”* may latter fuel activism (1999: 99), while W.H. Adams remarked that *“people who care about nature can often identify similar moments when their feelings crystallised, and they begin to understand the effects of industrialised society on wildlife and the countryside”* (Adams 1996: 79).

Thus action, the environmental movement, often comes from the reality of environmental destruction and appreciation of scenic wilderness not conversion through the reading of conservation texts, though as Hay points out it may be *“subsequently justified via recourse to an intellectually generated system of ideas”* (Hay 2002: 2).

### 5.3 Social movements and intellectuals

Little can be done about environmental destruction by the lone individual. Most people realize that to be effective they have to band together to form campaigning groups which can then combine to form a mass movement. As Mazur remarked *“The options usually available to someone who wants to express his concerns are limited: either waste one’s efforts on solitary protest with little chance of success or join a currently-running protest movement and pool resources with other sympathetic souls”* (Mazur 1981: 96).



### 5.3.1 Social movements

There is a great deal of research and academic debate on the significance of ‘social movements’ and in particular on the nature of new social movements (NSM), of which the anti-nuclear power and environmental movements are considered to be part. Environmental movements are defined in a recent Encyclopedia as “*loose, non-institutionalized networks of informal interactions that may include, as well as individuals and groups who have no organizational affiliation, organisations of varying degrees of formality...and are engaged in collective action motivated by shared concern about environmental issues*” (Barry and Frankland 2001: 176).

The emphasis is on networking, participation and collective action by a wide range of organizations, groups and individuals.

A social movement has four typical characteristics, according to Doherty et al (2000: 10):

1. It is based upon informal networks. These may include more formal organizations, such as pressure groups, but are also broader than them.
2. Those involved must share a set of beliefs and collective identity. This defines whom or what they see as allies and opponents, what their goals are and how they are to be reached.
3. Social movements are involved in collective challenges and may threaten their opponents with sanctions.
4. Social movements use protest and cultural practices, which may or may not be confrontational.

Research into social movements by political sociologists focuses on the cultural and sociological dimensions of collective action, and tries to relate this to structural changes in society. In contrast, political scientists describe social movements as interest or pressure groups, and focus on the instrumental assessment of groups’ involvement in policy making. Most early literature on the anti-nuclear campaign has taken the latter approach, concentrating on those groups and individuals whose contribution has an impact on the UK nuclear policy debate (Williams 1980; Patterson 1985) while more recent literature assesses the success of the international anti-nuclear movement in terms of policy influence (Joppke 1993; Flam 1994). Such a perspective gives emphasis to those groups (such as FoE) and individuals (such as Walt Patterson), with the required expertise and ‘respectability’, that can take part in national policy debate conducted in the national media and in parliamentary and judicial inquiries. In contrast a political sociology approach, as adopted by Ian Welsh (2000), concentrates on the actions of local anti-nuclear groups in developing a movement culture and mobilizing support. In this type of approach a historical perspective is required which trace a ‘trajectory’ by which “*embedded social, cultural and political relations*” shape society (Welsh 2000: 32). This political sociology approach



places emphasis on the creation of activist identity, and new forms of movement organization and expression. These include investigation onto the “*celebratory, carnivalesque elements in movement action*” and the rejection of “*hierarchical, authoritarian models of social organisation*” in favour of “*decentralised consensus decision making, non-sexist practices and non-violence*” (Welsh 2000: 224).

This thesis is not a work of political sociology, and thus cannot judge to what extent the 1970s anti-nuclear power campaign was what Mellucci (1981) would have called a ‘social movement’. I will, however, call it a ‘movement’ because this is a term contemporary activists used to describe it. The label ‘movement’ was also a popular description given to many other social and cultural activities often involving a small number of people, such as the ‘Communes Movement’. This thesis also rejects the abstruse theories and impenetrable language of much political sociology, but hopes to be mindful of its insights into the role of culture and information in shaping the 1970s anti-nuclear power movement. Also social movements, in wanting radical changes in society are unafraid of asking utopian questions. As Eyerman and Jamison comment, social movements as bearers of new ideas “*bring societies back to the big questions of what is man? what is nature? what is history?*” (Eyerman and Jamison 1990:165).

### 5.3.2 Movement intellectuals

This thesis is concerned with the interplay of ideas and action, with how some ideas can create a social movement. Crucial to this creation is the role of some people, termed ‘movement intellectuals’ who can not only communicate previously obscure ideas to a mass audience, but also build a movement - a mass of supporters willing to act- where none existed before (Eyerman 1983). In sociology intellectuals are viewed as those who are professionally engaged in the production of ideas or the manipulation of symbols - or in new class terms as ‘producers of culture’. To environmental historians, such as Samuel Hays they are those people who write, read, absorb and are preoccupied with ideas, and who are part “*of a network of writers, publishers and book reviewers who sustain mutual ways of thinking*” (2000: 215).

Eyerman and Jamison believed a necessary condition for the formation of a social movement is the generation of movement intellectuals who “*articulate the collective identity that is fundamental to the making of a social movement*” (Eyerman and Jamison 1990:118). They distinguish between the role of movement and establishment intellectuals in the formation of social movements, with the latter crucial in laying the groundwork for the formation of the movement. As Eyerman and Jamison commented (1990: 102):

*“The environmental movement emerged in large measure from the activity of established intellectuals, thus seemingly giving support to traditional accounts of the role of intellectuals in*



*social movements. It was out of the writings of ecologists and conservationists and perhaps especially popular science writers that the cognitive identity of environmental activism first came to be articulated. They were, for the most part, persons who were already socially legitimated intellectuals, either through their academic positions (Barry Commoner, Paul Ehrlich, Rene Dubos, George Borgstrom) or through their popular writings (Rachel Carson, Lewis Mumford, Vance Packard)."*

However it would be a mistake to claim that these establishment intellectuals created the environmental movement, for this is done by movement intellectuals in its early phases through more or less traditional means of mobilization: by creating its own organizations and its own networks in order to create a sense of collectivity. The movement intellectual articulates this new collective identity through speeches, tracts, articles and books and central to this process of self-formation is the constitution of an 'Other' against which the budding movement will interact (Touraine 1981). As Eyerman and Jamison comment (1990: 101):

*"The Other is not merely an intellectual construction, but is almost always a real social actor, an authority, the government, an institution, the state, or a conglomerate of individuals, the 'technocrats' with whom the movement must strategically interact".*

With the anti-nuclear power campaign this 'Other' was the controlling nuclear institutions, in the UK, the Atomic Energy Authority (AEA), and in the USA the Atomic Energy Commission (AEC), and more generally what Robert Jungk (1979) called the 'nuclear state'. As the movement develops the roles of movement intellectuals expands, from facilitator and ideologue to mass media communicator and finally to counterexpert. These counterexperts are often professionals based in existing institutions, who critical of the decisions and standards of the government experts, challenge them on behalf of an emerging 'public interest'. The counterexperts opposed not merely the state and its environmental bureaucracies, but also "*the elitist conceptualizations of knowledge epitomized by state expert*" and symbolized a democratic ideal, and a sharing of knowledge (Eyerman and Jamison 1990:104). It is this type of movement intellectuals, with the credentials and skills gathered in the institutions of the established society, who play a crucial role at the public inquiry, where the ideologue is at a disadvantage due to lack of expertise. Thus Walt Patterson, with his technical training in nuclear physics, fared well at the Windscale Inquiry whilst ideologues like Edward Goldsmith and Charles Wakstein received adverse criticism (Breach 1977i; Guardian 1978: 88-89).

As the movement matures it becomes increasingly professional and organizationally based, often employing the ex students, who had taken an active part in earlier campaigning, and been the spokesmen for the campaign. Later after the movement has dissolved, or incorporated into



institutions, they take influential positions in university departments, in law and journalism, and in professional organizations. They make history and then they (mostly men) write about it, and their accounts and analysis of their movement days form the basis of this (and many other) theses.

### 5.3.3 Why an activist?

Why do individuals join groups? Joe Weston in his analysis of FoE supporters -based on survey work by Cotgrove (1982)- found that a large percentage were at college during the 1960s and were influenced by the events of that decade (Weston 1989: 18). Describing the influences on the political beliefs of 'ten fictional Supporters' Weston mentions the influence of rock music, television images of war, famine and environmental disasters, and certain books which helped steer them towards green politics. Weston mentions Rachel Carson's *Silent Spring*, Ehrlich's *The Population Bomb*, and Rene Dubos' *So Human an Animal* which, he believed may "have first 'turned them on' to the problems of the environment" (Weston 1989: 18).

### 5.3.4 FoE Groups

Of course not all 1960s student who got 'turned on' to environmental issues joined FoE or other groups. Many who joined a group remain passive members, paying only a subscription and taking little part in activities; only a minority became activists. Motivation for activism was very varied, as Weston reported for his Oxford FoE group, which was "*a mixture of individuals who had come together for a diverse set of reasons and who were able to work together on specific events*" (Weston 1989: 162). He found that there was never any discussion of the reasons for the campaigns or the events, there was no attempt to draw up a constitution or explanation of why the group believed in what they were doing. He stated "*They all believed that it was wrong to continue to kill whales, to dump nuclear waste and to destroy wildlife sites. But simply because they shared those beliefs does not mean that they necessarily shared anything else*" (Weston 1989: 162). However it was the belief in (or enjoyment of) activism not environmentalism that brought them together "*Some were natural campaigners who could find and justify a campaign for almost anything. Others just wanted to be part of the general 'buzz' that surrounded such activity and of course still others did believe in green or ecological politics*" (Weston 1989: 162).

Derek Wall in his interviews with Earth First! activists found a wide variety of reasons for participating "*Accident, friendship, personal conviction, pleasure and political calculation were just some of the factors cited as influential*" (Wall 1999: 97). However the one common feature, he found, was that either a long standing green commitment, often of a passive nature, or activism outside the green movement. Wall argues that people become activists by being



recruited by their friends to participate in activities and that *“Friendship networks may ease individuals into activism at low cost or risk even if apathetic”* (Wall 1999: 96). Wall believed that activism is a way of life, and that new recruits are introduced to it by their friends through gradual involvement in ‘direct action’, moving over time from the fringes to the centre. As he comments *“Few individuals jump onto bulldozers... when first involved: repertoires have to be learnt. Activism, even in its most serious form, is a method of performance that must be developed and improvised”* (Wall 1999: 96).

Over time as people become more experienced they may find direct action *“exciting or even enjoyable”*, and this, together with new friendship links, intensifies the peer pressure to become full time activists. Wall points out that full time activism depends on personal availability, and can only be *“for the small minority of politically concerned who lack work and family commitments”* (1999: 97). These people are likely to be young and free, either unemployed or students, or more rarely self-employed. However participation in groups is essentially a social process with many cultural overtones; the availability of free time and a grudge is not sufficient for successful involvement. As Wall comments, ‘the protestor’ requires a cycle of gradual involvement and strengthening of network ties; and direct action *“may be like a ritual that eases the often traumatic and anxiety-inducing passage from one identity to another”* (Wall 1999: 105).

Whilst being a direct action activist can be a full time occupation, involving a change in lifestyle, most campaign groups - like FoE or ConSoc- cater to those with a conventional career seeking an ethical and exciting hobby. As Weston remarked on participating members of his Oxford FoE group (Weston 1989: 162):

*“For the most part though their involvement... was like any spare time activity taken on by people everywhere. It was a sort of ethical hobby taken up by people who want to belong to a group, and who, at the same time, like to confront authority. Being part of an active, successful, campaigning, as opposed to life-style, FOE group is almost a middle class version of football hooliganism”.*

### 5.3.5 Women Activists

Weston’s account of environmental activism as a sort of ‘ethical hobby’ or a ‘middle class version of football hooliganism’ perhaps reflects the dominance by men of the leadership and written accounts of environmental groups. This neglect of women activists in the UK reflects the ‘sexism’ of British protest movements in the 1970s. Women did the mundane work - the newsletter typing, the leaflet distribution, the petition gathering, the organizing of people to attend demos - while men did the more glamorous and high profile tasks - the writing of articles,



speaking at conferences and giving interviews. There was a view that men were the activists, women the supporters.<sup>65</sup> But beyond this simple 'sexism' there was in the anti-nuclear campaign an implicit assumption that only those with technical knowledge -preferably a Ph.D. in nuclear physics- could speak competently and credibly about scientific issues. There were some exceptions, notably Alice Stewart (Stewart and Sutcliffe 2000) and Rosalie Bertell (1985), both academics working on the health effects of radiation. But then health aspect were perhaps viewed by men, patronizingly, as acceptable concerns for women. When it came to the strategic technical and policy issues, in general it was held that only those with expertise and rationality should take part in public debates, otherwise there was the risk of being labeled 'emotional' and 'lunatic' and your views discredited, an opinion explicitly expressed by Walt Patterson in his interviews and books.

This view that men expressed 'facts' while women expressed 'emotions' permeated scientific thinking, even amongst the radical scientists who opposed nuclear power, such as those that wrote for Undercurrents, a magazine supposedly imbued with radical views on society. The views of women activists were ignored and their activities marginalized in favour of long 'scientific' articles by men. Only in autumn 1978 did Undercurrents give space to women writers, in its 'Special Issue on Women and Energy'. The only article on nuclear power was by Irene Coates, a member of the Windscale Appeal and participant at the Inquiry. The introduction to her article (written by the women editors, presumably) fully expresses the prevailing views about women and emotions (Coates 1978b):

*"We have heard the arguments for and against Windscale, most of them written by men. It is hard for a woman, faced with her feelings about nuclear energy to be listened to seriously. A feeling response to the environment is as valid a starting point for protest and political change as an argument based on intellect or economic analysis. It is time that such responses are given the credibility they merit".*

This neglect of women's views was despite their forming a substantial part of the anti-nuclear power movement. According to opinion polls, women in all countries, in all time periods, were consistently more anti-nuclear than men (Weart 1988: 367). This phenomenon, Weart believes, was connected with a tendency, when any technology was mentioned, for women to think in terms of safety, the environment and their children, whereas men would think more in terms of the benefits and perils of scientific progress. Also women diverged from men far more on nuclear reactors than on any other technology.

Given this anti-nuclear attitude it is not surprising that many of the activists in the early to mid 1970s against nuclear power in Britain were women - Betty Gazard at Stourport, and Jane Pink,



Beryl Kemp and Irene Coates from ConSoc. This grass roots leadership by women is also reflected in the United States, where roughly one third of local opposition groups were led by women (Mazur 1975: 67 note 37). Also in the United States women activists had a much higher profile in campaigns with activists Rose Gaffney, Jean Kortum and Hazel Mitchell playing significant roles in the first Californian campaign against nuclear power at Bodega Bay in the early 1960s (Wellock 1998). Later in California came the group 'Another Mother for Peace', formed in 1967 by 15 Beverly Hills women, which mobilized young mothers in the early 1970s to campaign against the genetic hazards of radiation (Wellock 1998: 154). Then the 1970s anti-nuclear campaigns produced well known women activists, like Anna Gyorgy who went on to write the seminal anti nuclear movement guide book *No Nukes: everyone's guide to nuclear power* (1979), Sheryl Crown, active in the Clamshell Alliance, who wrote *Hell no, we won't glow* (1979), and Helen Caldicott who wrote *Nuclear Madness: What you can do* (1980).<sup>66</sup>

#### 5.4 The environmental movement

Women also played a large part in early environmental activism, a role that is being increasingly acknowledged in reference works by environmental historians, such as by Carolyn Merchant (2002). However there is seldom a straight forward continuity of views, and it is historically inaccurate to imagine that Victorian activists - male or female- shared the same motivations and beliefs as 1970s environmentalists or 1980s greens. Though some may have been pacifist, anarchist or vegetarian, others held views which we would today denounce as highly sexist, racist and elitist. Thus Peter Coates remarked that Derek Wall's attempt (in *Green History*) to identify a green lineage can only be done by excluding people with 'right-wing associations', such as Octavia Hill, the founder of the National Trust. As Coates remarked "*For many eco-socialist, the British National Trust is tarnished by its close ties with the aristocracy and its preoccupation with preserving and restoring the elite landscape of the country estate*" (Coates 1998: 163).

It was however an influential minority of intellectuals and upper-class Victorians that 'emphatically rejected the imperative to *improve*' (Lowe and Goyder 1983: 19). Instead they established the first groups devoted to nature conservation, the preservation of buildings, the protection of animals and landscape, and combating pollution. There was considerable mutual co-operation and support between the different societies, and overlap in membership and leadership. Wildlife and historic preservationists often employed the same terminology, such as frequent references to the relics of the past and the relics of nature, or to ancient monuments and natural monuments - in much the same way, as Lowe and Goyder remarked, the term 'conservation' has been stretched "*to cover wildlife protection, building preservation and the*



husbanding of resources” (1983: 18). The emphasis, as the titles of the organizations suggest, was on preservation and protection of old England against the corruption of ‘progress’ and the evils of the industrial city. As Lowe and Goyder remarked “*Victorian preservationism, was distinctly a gentlemanly avocation pursued by cultured people well removed from, and indeed averse to, the base pursuits of trade and manufacture*” (Lowe and Goyder 1983: 20). It was also, in its provision of free open spaces in cities and the countryside, a response by social reformers, such as Octavia Hill, to head off the challenge by the industrial working class over access to the sporting estates of the landed aristocracy, which was to culminate in the mass trespass on Kinder Scout in 1932. Overall in the first half of the 20th century the emphasis was on ‘conservation’ right up to the founding of the Conservation Society in 1966.

### 5.4.1 Group formation

Societies and groups are being started all the time; few however will last for decades or even a century as has the National Trust (see Table 5.1).

Table 5.1: Date of Founding of Major ‘Environmental ‘Groups illustrating change in terminology.

Society for the Protection of Animals 1824.
Commons Preservation Society 1865.
Association for the Protection of Birds 1870.
Society for the Protection of Ancient Buildings 1877.
The Selbourne Society for the Protection of Birds, Plants and Pleasant Places 1885.
Society for the Protection of Birds 1889.
National Trust for Places of Historic Interest or Natural Beauty1894.
Society for the Preservation of the Wild Fauna of the Empire 1903.
British Empire Naturalist Association 1905, then renamed British Naturalist Association.
Society for the Promotion of Nature Reserves 1912; then renamed
Society for the Promotion of Nature Conservation.
British Ecological Society 1913.
Council for the Preservation of Rural England 1926.
International Union for the Protection of Nature (IUPN) 1948, then renamed International Union for the Conservation of Nature and Natural Resources (IUCN) 1956.
Conservation Corps 1959, in 1970 renamed The British Trust for Conservation Volunteers.
World Wildlife Fund 1961.
Natural Environment Research Council 1965.
Conservation Society 1966.
Committee for Environmental Co-ordination (CoEnCo) 1969.
Friends of the Earth UK 1970.
Greenpeace (London) 1970.
<u>Your Environment</u> 1969.
<u>The Ecologist</u> 1970.
Socialist Environment Resources Association (SERA)1973.
Ecology Party 1975 (Previously called People Party1973).
Society for Environmental Improvement (SEI) 1974.
The Lawyers Ecology Group.
Political Ecology Research Group 1976.
Liberal Ecology group; Conservative Ecology group 1977.
(Vancouver) Greenpeace UK 1977.
Green Alliance 1978.

Sources: Vernon 1981 Table 1; also Wallis 1972 Section 24: Directory; Sheail 1976; Lowe 1983; Mercer 1995.



The founding of groups is generally in response to public awareness and favourable media attention to an issue: groups brave enough to campaign on an obscure (or unpopular) issue attract few supporters and little funding. Lowe and Goyder divide national groups into two categories: 'emphasis' and 'promotional' groups. The former are groups "*whose aims do not conflict in any clear cut way with widely held social goals or values*", while the latter are groups "*that promote causes involving social or political reform*" (Lowe and Goyder 1983: 35). Of the 77 groups they surveyed in the late 1970s, 48 were emphasis groups (like the National Trust) while 28 were promotional (like the Conservation Society or FoE). They remark that promotional groups are much younger (with a mean age of 8 years) than the emphasis groups (mean age 43 years), saying "*a tendency for groups to evolve from a promotional to an emphasis role, or to fade away if their reforming efforts seem no longer relevant*" (Lowe and Goyder 1983: 35). Promotional groups are also much smaller, perhaps because they are so much younger, seldom having a membership of 10,000 compared to memberships of over 100,000 for long established groups like the National Trust or RSPB.<sup>67</sup> Most groups will remain very small scale and obscure, generally run by a committed enthusiast attracting few supporters and then fade away - the archetypal 'one man band'. Some are only designed for a short life span, such as local campaigns to oppose an unwelcome development, these will include the classic 'NIMBY' protests. Finally there will be a few societies which are initially successful attracting thousands of members and became nationally well known, but then enter a period of long decline as the public loses interest in them and their members drift away to more dynamic groups. These societies are basically unable to adapt either organizationally or intellectually to changing circumstances and public interests. A prime example of this type of society was the Conservation Society (ConSoc) founded in 1966 to campaign on population issues which peaked in 1973 and then entered a long period of decline before being wound up in 1987 (Herring 2001). As Lowe and Goyder remarked (1983: 36):

*"...many groups which challenge established values never become established. Some simply cease to exist. This is a particular tendency with single-cause promotional groups. Sometimes it is demonstratively clear that they are redundant, having decisively succeeded or failed to achieve their original objects, and it is possible therefore for all concerned to agree to call it a day".*

One notable example of a failure was 'The Anti-Concorde Project', basically a 'one-man band' led by Richard Wiggs which achieved substantial publicity and support from environmental groups, including FoE.<sup>68</sup> Whilst most groups pack up in a few years if they do not achieve some success, a few groups persevere for decades generally in obscurity often braving periods of



media ridicule and hostility, with even sympathetic observers doubting their value. Lowe and Goyder commented *"Only a few groups soldier on with little prospect of success. Examples include the Soil Association... and animal rights and anti-vivisection group"* (Lowe and Goyder 1983: 36). In fact, these three groups have done particular well since the early 1980s, with the Soil Association being able to benefit since the late 1980s from public fears over food safety, together with high profile support from conservation figures like Prince Charles. Animal rights campaigners have through dedicated, persistent and sometime violent direct action achieved major changes in farm welfare standards, often in the face of hostility from the media and prosecution from the police. These sorts of uncompromising activists are *"people who in their life and work styles are singularly committed to the particular values expressed, [which] helps to explain their tenacity in the face of adversity"* (Lowe and Goyder 1983:36).

#### **5.4.2 The new environmental movement**

The media attention on environmental problems in the 1960s, on issues like the killing of African wildlife, the threats of over-population and the destruction of British towns lead to the formation of such societies as World Wildlife Fund (latter called World Wide Fund for Nature or WWF) in 1961, the Conservation Society in 1966, and the Victorian Society (1958) and hundreds of civic amenity groups. As one perplexed journalist commented there was then a sudden burst of new enthusiasm for protection of the earth's ecosystems, what he called a *"fragmented crusade of maddening complexity but endless energy"* which was simple in comparison with trying to describe what it stood for, as *"What makes the environment movement so difficult to pin down is that its intellectual origins are as diverse as the motives of the people who have taken it up"* (New Statesman 1973: 146).

Media attention and public interest also caused existing organizations, who were not founded for environmental reasons like the Boy Scouts, the Church of England and the National Union of Students, to become interested and set up specific groups to cater for their members' interest. Environmental interest can also be more opportunistic: to show concern in order to recruit new members and, for business organization, to create a favourable impression amongst the public - what is now labeled 'greenwash' (Greer and Bruno 1996). As Lowe and Goyder point out, throughout the 1960s an increasing range of organizations attended the three 'Countryside in 1970' conferences, from 90 for the first one in 1963 rising to 335 by the last one in 1970 (1983:9). However only a small proportion, perhaps 10%, of the increase in numbers attending the conferences from 1963 to 1970 was due to the formation of new environmental groups: in the decade of 1966-1975 less than 25 national groups were formed (Lowe and Goyder 1983: 16). Thus the vast majority of the increase in numbers was due to existing organizations and



businesses claiming a new interest or concern about conservation. Similarly there was a big increase in the number of local amenity societies during the 1960s with 300 of them in 1960 rising to over 700 in 1969 and 1250 in 1975, with membership rising from less than 50,000 in 1960 to about 150,000 in 1969, and 300,000 in 1975 (Lowe and Goyder 1983: 89).<sup>69</sup> They estimate (for 1979-80) there to be about two million members of national groups with another one million in local groups (1983: 37). However only a small proportion of these millions were to be active in the 1970s environmental movement, and an even smaller proportion in the anti-nuclear power campaign.

To the young eco-activists in the early 1970s there was a very clear distinction between the old conservation groups and the new groups. This new eco-action movement was very selective in the groups it wished to associate with, and only those older groups whose work reflected the new ecological values were included. This becomes apparent in a survey of the groups listed in the alternative and environmental press for the years 1968-74.<sup>70</sup> These mentions, in the listing columns, reflect the writer's view of what constitutes the environmental movement. Sometimes the juxtaposition of groups is strange: The Conservation Corps with the League against Cruel Sports (Country Bizarre No.3), or the Dwarfs and the Environmental Consortium (Ink No.7). There are 81 mentions of 33 groups in the listing column, with by far the most frequent being the Dwarfs (13), followed by FoE (7), ConSoc (6), and Soil Association and Conservation Corps (5). The large number of mentions of the Dwarfs, mainly in the alternative press, reflects its tendency to have listing columns and their more frequent publication.<sup>71</sup>

Groups mentioned can be divided into 6 categories:

New groups (22)	FoE (7), ConSoc (6), BSSRS (2), SERA (2), ITDG (1), Transport 2000 (1).
Eco-Parties (21):	Dwarfs (13), Diggers (3), People Party (3), Provos (1), Movement for Survival (1).
Traditional (16)	Conservation Corps (5), Environmental Consortium (3), RSPB (2), CPRE (1), Nature Conservancy (1), National Trust (1), NSCA (1), TCPA (1), WWF (1).
Local (8):	PEST (4), Greenpeace (London) (2), Action for Survival (1), Earth First (1).
Organic (7):	Soil Association (5), Henry Doubleday Research Association (2).
Animal welfare (7):	RSPCA (3), People's Dispensary for Sick Animals (2), BUAV(1), League against Cruel Sports (1).

It is interesting to compare this listing with that contained in *The Environmental Handbook* (Barr 1971) published by FoE. All the ones above in the 'Traditional' and 'Organic' category are mentioned, including FoE and ConSoc in the 'New groups', but none in the 'Animal Welfare'. There is also another listing of over 130 groups in the book by Wallis (1972), of these 10 are new groups, 6 are Organic, and 6 are Animal Welfare, there are also 2 groups concerned with birth control and abortion, reflecting conservationist preoccupation with population issues. The most respectable (or least hippie) environmental magazine, The Ecologist listed just traditional groups plus BSSRS (in the December 1970 issue), whilst the alternative press always mentioned the Dwarfs and some of the 'New groups' and 'Animal welfare' ones, but hardly ever the 'Traditional' ones. It was Country Bizarre, the first rural underground magazine, that acted as a bridge between the old and new groups, mentioning the Conservation Corps, RSPB and WWF alongside FoE and ConSoc, besides the RSPCA and the League against Cruel Sports. Resurgence magazine was also a bridge between the 'New groups' and the 'Organic' agriculture groups of the Soil Association and the Henry Doubleday Research Association (HDRA). The reason for the popularity of the Conservation Corps (founded in 1959) probably reflected its appeal to young students, with many student eco-action groups acting under the name of the Conservation Corps (see pp. 302-8 in Barr 1971).

#### **5.4.3 Pre-FoE Eco-Action**

In the early 1970s the venues for young eco-activists were somewhat limited: for the outdoor types there was the hard physical work of the Conservation Corps, for hippies the anarchist festivals of the Dwarfs, and for the serious (and dull) the local branch meeting of the Conservation Society. It was the good fortune of FoE that it was able to harness the energies and distinctive style of local groups that sprang up after its widely publicized bottle dump in May 1971.

However these local FoE groups did not consist just of new activists, they drew on the expertise and experience of activists who had been involved in environmental campaigning far longer than FoE's full time staff, who were ex students. Also many were not content to follow FoE's centralized approach to campaigning, and wanted a more 'life style' lead approach to bringing about social change (Weston 1989: 39).

The multiplicity of small groups from a wide variety of cultural and political positions campaigning on environmental issues in the early 1970s is explored by Derek Wall in his history of the anti-roads movement in Britain. He wrote that in the second week of February 1972 there was the start of a month of action by Manchester Non-Violent Action Group to promote free public transport, whilst the Dwarves along with the Young Liberals, held an anti-car



march along the route of the M12 (1999: 29).

In 1971 Victor Anderson, organized a 'reclaim the streets' action that attempted to block Oxford Street in London, with a second action in the spring of 1973 held in Piccadilly Circus, with the aim of demanding free public transport and car-free streets. These events were launched by 'Commitment', a Young Liberals group, with Peace News (17 December 1971), proclaiming the first event to be "*the greatest street party London had ever see*" (Wall 1999: 29). Victor Anderson recalled in interview with Derek Wall (1999: 29):

*"These actions drew upon emerging networks of green activists and counter-culturalists; we had links with people like the Dwarves, [and] a magazine called Street Farmer. I mean, we didn't have a lot to do with them but that was all part of what was going on, the Peace News thing... and then there was local independent environmental action groups who organized part of the demonstration ... There was PEST - Planet Earth Survival Team-somewhere in north London. There were people responding to the issues, setting things up on their own. This is before Friends of the Earth".*

The diversity of groups was acknowledged by contemporary observers. Roy Gregory, commenting on the enormous range of interests and attitudes "*united by broad desire to maintain or improve quality of environment*", remarked "*it is not easy to accept that the Oxford Street action committee, the Dwarves, the Street Farmers, and groups firmly embedded in the hippy world are part and parcel of a movement which also includes bodies like the Civic Trust, the CPRE and the National Trust*" (Kimber and Richardson 1974: 224).

It was precisely this combination of 'the hippy world', traditional organizations like the RSPB and the RSPCA, and newer ones like the Conservation Corps and ConSoc that formed the universe of the early eco-activist. These new groups, having a large branch network, were often the first society for young people interested in environmental issues. However young people tended to drift away from ConSoc because of its staid image and methods, to more radical groups such as the Young Liberals, and later FoE (Herring 2001: 395). Nevertheless ConSoc played an important role in the development of the emerging environmental movement of the 1970s and as Wall commented "*The society acted as a particularly significant bridge between middle-class conservation groups such as the civic societies and more radical green campaigners like the Dwarves*" (Wall 1999: 31).

#### **5.4.4 FoE UK formation**

The use of friendship networks (or what sociologists call 'social networks') to recruit activists to work on environmental projects is well illustrated by the setting up of a national branch of FoE in Britain in 1970. FoE had been started by David Brower in 1969, when he quit the Sierra Club



in California which resisted his attempts to adopt a more radical and confrontational approach to what he saw as 'an emerging ecological crisis' (Weston 1989:33; Wellock 1998: 68-71).<sup>72</sup>

Brower realized that any action to halt a global problem would have to be tackled at an international level and in 1970 he traveled to Europe to 'spread the word' and encourage the formation of branches of FoE in France, Sweden and Britain.

He started in France with help from two Americans, Amory Lovins, a physics student, and Edwin Mathews, a Paris-based lawyer. Their efforts lead to the founding of Les Amis de la Terre in France by Brice Lalonde -then a young economist but latter to serve as Minister of the Environment in 1991-92 under the Presidency of Francois Mitterand (Lamb 1996:35).

While on holiday in Ireland in August 1970, Mathews met Barclay Inglis, a retired Scottish businessman, and talked about the possibility of forming a British FoE group and Inglis decided to organize a special dinner in London to recruit potential activists. The dinner at the exclusive Travelers' Club in The Strand was attended by Brower and 14 guests invited by Inglis, amongst them Graham Searle and Jonathan Holliman (Lamb 1996: 35).

Searle was Vice-President of the National Union of Students (NUS) and chairman of the NUS Committee on the Environment and had given a speech at the 'Countryside in 1970' conference, whilst Jonathan Holliman was a young writer and campaigner then working for the International Youth Federation for the Environment.

A decision was made to form FoE UK, not as a charity but as a company limited by guarantee and owned by its seven original members. This was to allow it to campaign for political change in order to protect the environment, something that was not allowed for under the Charities Act. As Weston commented (1989: 34):

*"...FOE was designed to be a small, highly specialised, pressure group which could concentrate its efforts on forcing changes to the policies of national government. Unlike the conservationist groups, FOE did not seek or particularly want thousands of members. it wanted to be small. centralised and dynamic".*

To this aim the seven members of the company placed the running of the organization into the hands of three people, Barclay Inglis as Chairman, Richard Sandbrook as Company Secretary, and Graham Searle as the organization's first Director (Weston 1989: 34).<sup>73</sup> In October 1970 the new company, Friends of the Earth UK Ltd., with its three full time staff, Searle, Holliman and Janet Whelan, moved into an office provided by Ballantine Books at 8 King Street, London, and in order to raise funds started work on British editions of the American environmental paperbacks, like *The Environmental Handbook* (Barr 1971) and *The Consumers Guide to the Protection of the Environment* (Holliman 1971).



#### 5.4.5 FoE's bottle dump: gesture as theatre.

There was much discussion within FoE during early 1971 over the subject of the initial campaign that it should run. It was narrowed down to three issues: opposition to aspects of the fur trade, to the proposal by Rio Tinto Zinc (RTZ) to mine in Snowdonia National Park, and to the decision by Cadbury-Schweppes to switch from returnable to non-returnable bottles (Pearce 1991: 50). But it was rather by luck than design that FoE's first action, the return of bottles to Cadbury-Schweppes' offices on Saturday 8 May 1971, achieved phenomenal publicity and launched FoE onto the public's attention. As Weston remarked "*The bottle dump event was really a media coup for FOE. That style of political activity had not been seen in Britain before and was, until then more associated with the American system of pressure group politics*" (Weston 1989: 35).

This style of action, protest as theatre, was typical of Californian counter cultural activities pioneered by the San Francisco group 'The Diggers', which had been used by Ecology Action, the first hippie environmental group founded in Berkeley in January 1968 (Allaby 1971: 63). A similar group was founded in Boston in 1969, and amongst their activities (according to their November 1969 newsletter) "*was a recycling project in which they would try to persuade beverage companies to re-use the glass and metals in their bottles and cans*" and their 'Garbage Group' "*was planning a 'dump-in', possibly on the steps of the State House*" (Allaby 1971: 65).

The strong influence of American student politics on the activities of FoE in the UK is acknowledged by Philip Lowe and Jane Goyder (1983) in their analysis of FoE's style and strategy. They stated "*Friends of the Earth's roots are American, not British*" and note that this new breed of environmentalism was radical not only in its broad field of concern but also in its campaigning methods also (Lowe and Goyder 1983: 127). They commented (1983: 127):

*"FoE's approach was more open, media-orientated and confrontational, again betraying its American origins. It also incorporated notions of participatory democracy and forms of direct political protest, such as boycotts, sit-ins, marches and demonstrations, borrowed from the student movement".*

Eco-activists need plenty of free time and few commitments and thus it is not surprising that students were attracted to FoE in the early 1970s. Also there was disillusionment with the other great causes of the 1960s: student protest which had degenerated into violent street demonstrations and often harsh reprisals from the police (especially in the United States) and the counterculture with its unintellectual diet of 'sex, drugs and rock and roll'. Thus a movement that combined the intellectualism of student politics with hippie style and humour



proved very popular with non-Marxist students, especially Young Liberals. As Walt Patterson remarked "*FoE's Schweppes 'demo' gave the word a novel slant: instead of a bitter, even ugly confrontation, it was witty and engaging*" (Patterson 1984:143). Or as Graham Searle, said in a 1974 interview "*I hope that one of the things we've added [to the environmental movement] is a bit of humour*" (Rivers 1974: 125).

The result of FoE's first bottle demo was extensive media publicity and with it, growing membership and influence that was to make it the leading environmental group in Britain by the mid 1970s. However in terms of numbers it remained smaller than ConSoc until the late 1970s: having only 1,000 members (termed 'supporters') by end of 1971, just 5,000 in 1976 and 16,000 by 1979 (Lamb 1996: 206). As the 1970s progressed FoE, by harnessing and expanding its local groups, became a national organization. Its local groups, with a winning combination of action, hippy style and moderate politics, attracted young activists from existing groups, like ConSoc and the Dwarves, both of which went into decline and have now been largely forgotten.

#### **5.4.6 Early anti-nuclear activism**

Early anti-nuclear activism reflected the style and tactics of existing conservation groups, mainly middle class and middle-aged. The earliest protests, such as at Bradwell, involved letter writing and conventional political lobbying. The only demonstration was at Trawsfynydd, and that was by locals in favour of the nuclear plant! The protest at Stourport in 1970 again followed conventional patterns of lobbying in the press and of government, but this time there was the founding of a group, the Anti-Powerport Station, to oppose the plant. Their rhetoric was also more militant, with calls for a register of objectors and of 'militant anti-nuclear power station rallies' with further talk of raising money to employ a barrister to state their case at a public inquiry (KT&NS 5 June 1970: 10 & 13).

In the early 1970s unlike the US, France or Germany there was no mass anti-nuclear campaign in Britain. Partly this was because no new stations were being proposed, and partly that there was little public discussion of nuclear affairs. Interestingly Peter Bunyard claims that one of the first anti-nuclear demonstrations in Britain was organized by foreigners at the annual CND march, to the general incomprehension of British anti-nuclear bomb protestors. (Bunyard 1981: 181).

The first national campaign was started by ConSoc in 1974, but its conventional approach attracted little support from young environmentalists, such as with FoE. By late 1975 Beryl Kemp, its organizer, reported that she was becoming disillusioned with lack of progress with the 'constitutional' approach and wanted to use a new form of action, that seemed so successful overseas, 'non-violent resistance action' (ConSoc 1976a: 15).



However it was not the tactics that were wrong, but the lack of appeal of an anti-nuclear power campaign run by ConSoc. The campaign was not able to attract many followers until movement intellectuals, such as those around the magazine Undercurrents, were able to articulate a collective identity and establish an 'Other' against which a movement could interact. It was this that the Undercurrents collective did with their first issue on nuclear power (No. 9) in early 1975. This publicity for an anti-nuclear campaign from the leading radical environmental magazine was then harnessed by FoE, who were able to launch their anti-nuclear campaign in May 1975. This was a typical piece of FoE street theatre for the media: a birthday party and cake with candles, to mark the 10th anniversary of the commencement of work on the still unfinished Dungeness B nuclear power station.<sup>74</sup> The birthday party attracted little public attention but a phrase FoE used in their tabloid style paper Nuclear Times published at the same time was unwittingly, like FoE's initial bottle dump in 1971, to achieve intense media coverage and launch anti-nuclear concern to the top of the environmental agenda. The next chapter seeks to explain what it was about nuclear power that roused such concern and opposition.

## **6. Anti-nuclear explanation: from image to action**

Why was there an anti-nuclear power movement: why not an anti-asbestos movement or a campaign against some other industrial process that produced greater environmental damage and had a far worse health and safety record, like coal mining?<sup>75</sup> This chapter attempts to give an explanation for the rise in anti-nuclear power (or popularly called ‘anti-nuke’) protest. The potential implications of new technologies are often explored by science fiction writers and this was very much the case with nuclear power. Indeed, in some ways it will be argued that they set the tone for the public responses that occurred later, arguably to a much greater extent and earlier than other media. This chapter first looks at the portrayal of ‘atomic’ energy in science fiction (SF) novels, which started with H.G. Wells’ 1913 novel, *The World Set Free*. This sets the tone for the ambiguous vision, for both science fiction and the public, of atomic energy as a possible source of both immense destruction and abundant salvation. The second section looks at how this ambiguity was recorded in opinion polls, which reflected longstanding anxieties over radiation. The third section examines the ‘anti-nuclear impulse’, the emotional forces that cause people to become anti-nuke. In this analysis it draws heavily on the work of Spencer Weart (1988) who uses the term ‘nuclear fear’ to explain opposition to nuclear power, and how this fear was heavily influenced by images of the nuclear bomb in popular culture. It then gives personal explanations for being ‘anti-nuke’, starting with the ethical and conservationist concerns of Schumacher during the 1950s and 1960s; then reasons given by leading 1970’s anti-nuclear activists in the UK in interviews with the author. The final section looks at the growth of anti-nuke groups in the US, drawing on sociological work which explains activist recruitment in terms of ‘friendship networks’. It illustrates the explanations and reasons given in the Chapter through examining the rise of anti-nuke opposition in the United States from the late 1960s with the recruitment of anti-nuclear activists from the anti-war movement.

### **6.1 SF visions**

Writers such as Paul Boyer (1985) and Spencer Weart (1988) believe that SF has been a powerful force in shaping societal attitudes to the atomic bomb. In this section I argue that, given the close links between the bomb and nuclear reactors, SF has also been influential in shaping attitudes to nuclear power. The two were first linked by Frederick Soddy, a leading nuclear physicist in the early 1900s, who gave us the twin visions of atomic energy as both a source of abundant energy and of immense destruction, both of which drew on early literary images of a scientific future. Soddy’s 1909 book *The Interpretation of Radium* had a powerful impact on H.G. Wells who dedicated his 1913 novel, *The World Set Free*, to Soddy’s book.



Wells in *The World Set Free* predicted that in the 1930s, scientists would release atomic energy, and that by the 1950s this knowledge, in the form of what he called 'atomic bombs', would lead to a devastating worldwide nuclear war, with hundreds of cities left in ruins. The quintessential image of the atomic bomb, the mushroom cloud was absent, but Chris Morgan, a SF commentator, wrote that the essence of the bomb, its name and the terror it conveys are definitely foreshadowed (1980: 72).<sup>76</sup> The atomic bomb (or a weapon of similar destructive power) soon became a staple of SF, which reflected the vigour of two of the 20th Century's favourite nightmares - the fear that the human race has an unlimited capacity for self-destruction and the dangers of uncontrolled scientific experimentation. However others saw optimism in *The World Set Free*, as the novel ends with the formation of a world government, which sets the world free from war, insecurity and the struggle for existence. As Spencer Weart commented "*At the story's end citizens could travel where they chose in atom-powered aircars, building atom-powered garden cities in deserts and arctic wastes, enjoy liberty and free love. Wells had neatly fitted together fragmentary notions about science and atomic energy to craft the first full-scale scientific legend of atomic Armageddon and millennium*" (Weart 1988: 26). Alvin Weinberg was one youthful scientist who was deeply influenced by the atomic visions of Wells, to whom he later paid tribute. In 1966 Weinberg predicted a glorious future for nuclear power saying that "*if nuclear energy does not, as H.G. Wells put it, create 'A World Set Free', it will nevertheless affect much of the economy of the coming generation*" (quoted in Hilgartner et al 1982: 188). Wells' imagery of atomic-powered cities was evident in the plans in the 1960s by scientists at Oak Ridge, the 'City of the Atom' in Tennessee, to develop the 'nuplex' (a nuclear complex). This was to be a town centred on reactors which could be located anywhere in the world regardless of geography or climate. Alvin Weinberg proudly explained in 1971 in Foreign Affairs that this was precisely the dream of a world set free that he had learned from H.G.Wells (Weart 1988: 303).

However public ambiguity about atomic energy was reflected in inter-war SF novels: for some it was a means to disaster, but to others it was a means of salvation.<sup>77</sup> One early eco-catastrophe novel, *Nordenholts Million* by J.J.Connington in 1923 had disaster only averted by the heroic development of an atomic energy machine. The treatment of atomic energy by SF writers before the 1940s was in the long tradition that the civilization of the future could not progress technologically without being in possession of a plentiful and efficient source of power. The discovery of 'atomic energy' in the early 1900s gave SF writers a new source of unlimited power which could be used in their stories. As Stapleford comments atomic energy was 'clearly magic in disguise', ranking along with other imaginary powers sources as 'vril' (used in Bulwer



Lytton, 1871, *The Coming Race*) and ‘apergy’ (in Percy Greg, 1880, *Across the Zodiac*). By the 1920s ‘atomic energy’ had become the power system which would provide limitless energy and bring utopia. An typical example of such banality is *John Sagar* (1921) by ‘Nedram’ where an inventor gains control of atomic energy, becomes self-proclaimed ‘Master of the World’ and sets about creating an utopia for all (Morgan 1980: 123). In the late 1920s atomic energy was vigorously promoted by Hugo Gernsback in his magazine Amazing Stories. He predicted its use in the near future, and referred to the coming era of high technology as ‘The Atom-Electronic Age’ or ‘The Age of Power-Freedom’.

### 6.1.1 Atomic power

However in the 1930s SF stories dealing with atomic power became much more realistic, primarily due to the influence of John W. Campbell, the editor of Astounding Science-Fiction (ASF). This magazine was widely read by science and engineering graduates and prided itself on its scientific accuracy. Campbell, who had thought deeply about the realities of atomic energy, had published a number of stories since 1930 -*When the Atoms Failed* (1930) and *Atomic Power* (1934)- and in editorials from June 1938 had declared the reality of atomic fission (Weart 1988: 82). The announcement of the achievement of atomic fission by Niels Bohr in January 1939, was followed by widespread press coverage and speculation on its uses, and enhanced credibility for Campbell. In September he published Robert Heinlein’s first atomic energy story *Blowups Happen*, with an editorial announcing that this story was based on the latest discoveries (Weart 1988: 82). This is perhaps the first SF story on the possibility of an accident at a nuclear power plant, and is noteworthy in the way it deals with the psychological stress involved in working at a nuclear power plant when one mistake might causes widespread devastation. This theme of the potential for a disastrous accident was again explored in *Nerves* by Lester del Rey, published in ASF in 1942.

After the dropping of the atomic bomb in 1945 SF writers were acknowledged as prophets proven right, and many managed to become professional writers. Some, like Ray Bradbury and Robert Heinlein, prospered as the mass circulation magazines Colliers and The Saturday Evening Post began to publish SF. Others became writers of popular science and academic consultants, but most had an ambivalent position on atomic energy because of the Bomb, and as Albert Berger remarked many SF writers “*were both disappointed in and fearful of the ways in which the government proposed to handle its ‘ultimate weapon’*” (Berger 1976: 143). A few maintained their optimism, with Theodore Sturgeon writing in ASF in December 1945 that “*he celebrated the possibilities of nuclear power for changing the world*” (Berger 1976: 143).<sup>78</sup>



In the immediate post war era while science journalists were producing exalted prophecies of the bright promise of atomic energy, SF writers were almost invariably producing bleak and pessimistic stories on its social consequences. But as Paul Boyer remarked "*These two responses that seemed so contradictory - the terror of atomic war and the vision of an atomic utopia- were in fact completely interwoven*" (Boyer 1985: 109). The Bomb in fact ended the SF vision of atomic energy as the route to utopia, it was now the road to dystopia. As the initial flush of enthusiasm by science journalists for atomic energy faded by the late 1940s under criticism from economists and scientists, the cultural climate turned deeply pessimistic and inward looking. Thus at the dawn of nuclear power there were deeply conflicting images of atomic energy, and of the future direction of society. The optimists believed that the atomic bomb could be controlled and "*atomic energy made a great blessing to mankind*", while the pessimists, the SF writers "*were offering a countervision almost unrelieved in its bleakness and despair*" (Boyer 1985: 265).

## 6.2 Public opinion

The post war ambiguity of SF writers about atomic energy was reflected in public opinion. There have been polls on nuclear power in most nations, and at most times since 1945, and Weart's analysis of them is that there are five groups of roughly equal size (Weart 1988:365):

*"The first group were strong advocates, confident in the ability of experts to keep reactors safe and impressed by the benefits of economic growth. Directly denying all that and about equally numerous were the convinced opponents, at first silent but increasingly vocal. In between were those who leaned one way or another, a group who favoured reactors even while harbouring some misgivings about their safety, and a group who frankly feared reactors but were not convinced they should be banned. Both these middle groups would usually go along with whatever the authorities decided".*

Finally the last group consisted of people with no position, and often no interest, in the whole question. Thus only about 20% of the public could be called nuclear supporters, with the majority of about 60% either against or fearful, with the remainder as 'don't know'. It was the two middle groups who were the 'swing' voters, usually going along with whatever the authorities decided. When the authorities were confident they joined the strong advocates, when the authorities were divided over safety issues they hesitated and adopted a 'wait-and-see' attitude. Thus public confidence and trust in nuclear authorities was crucial in winning their support, and when this began to crumble in the early 1970s support fell away.

However overall the anti-nuclear campaign produced only modest shifts in opinion rather than major swings, as Weart remarked "*negative attitudes, like positive ones, had been present*



*everywhere for many decades*” (Weart 1988: 366). Advocates and opponents of nuclear power were spread quite evenly throughout most social groups, with the education making little difference to their views. Weart remarked that “*studies showed that the way people felt about nuclear power was mostly independent of how much they knew about it. (In fact, most people had only rudimentary knowledge mixed with various bits of misinformation)*”. He concluded that “*when a person took a nuclear stance it was not from some special knowledge or lack of it, but as a total approach to society*” (Weart 1988: 366). The only factor, according to the polls, associated with anti-nuclear opinion was sex: women in all countries, in all time periods, were consistently more anti-nuclear than men (Weart 1988: 367). Weart’s explanation for this divergence in opinion lies in the symbolism of nuclear technology for women, and that “*it had become most specifically associated with aggressive masculine imagery: weapons, mysteriously powerful machines, domination of nature, contamination verging on rape. On no other technological issue was the sexual imagery so thoroughly developed and, from a woman’s standpoint, so viscerally disturbing*” (Weart 1988:367).

Public attitudes to nuclear power can also be surmised from analysis of the titles of articles published in popular magazines. An analysis by Weart of *Readers Guide to Periodical Literature*, revealed that in 1950 well under 10% of the titles had suggested that there was anything to worry about. Anxiety began rising in the 1950s, paused during a period of disinterest in nuclear power during the mid 1960s and rose steadily thereafter reaching a plateau of about 25% in the early 1970s, before rising from 1975 to over a third by 1980, and surging upwards in the early 1980s to reach 90% by 1986 (Readings from Figure 2 in Weart 1988: 387). In contrast the optimistic articles peaked at nearly 50% in the mid 1950s under the influence of the ‘Atoms for Peace’ rhetoric, then began a steady decline from the early 1960s reaching less than 10% by 1970 and stabilizing there. The crossover point from optimism to pessimism is the late 1960s, the start of the anti-nuclear power movement in the United States, also the time of minimal interest by periodicals in nuclear power issues. A similar result was obtained by Harold Kohn in his analysis of books on nuclear energy in the Ohio State library; of the 77 books published up till 1965, only 5 were anti-nuclear with 22 pro and 50 neutral (Kohn 1984: 50). However between 1965 and 1980 of the 83 books published, 45 were anti-nuclear with only 18 pro and 20 neutral.

### **6.2.1 Anxieties over radiation**

The numbers involved in the anti-nuclear power protest were small in the US and most European countries until the early 1970s, but they did have an impact on public opinion despite strong support for nuclear from government, business, the trade unions, most professional



organizations and political parties. That the small anti-nuclear power movement could shift public opinion was a source of puzzlement to early nuclear commentators, who believed that nuclear energy enjoyed high public support until the early 1970s, and that support fell away due to a 'pervasive value shift' (Cotgrove 1982). Ian Welsh, in his sociological study of the UK nuclear movement, challenged this view that *"there was a past golden age of public acceptance or at least public quiescence"* and that *"the public acceptance of nuclear power only became problematic in the early 1970s"* (Welsh 2000: 2). Welsh argues instead that there was a profound, but concealed, public ambiguity over nuclear technology amongst the public and *"this ambivalence and more committed public opposition is based in social, cultural and moral attributes as well as scientific and technical ones"* (Welsh 2000: 31). There have always been expressions of unease about nuclear reactors but until the 1970s this was dismissed as 'unreal'. For instance a small group of parliamentary backbenchers in 1956 raised a series of issues, including reactor safety, the adequacy of plans for nuclear waste disposal, and the dangers of low-level radiation but in response the Government was 'perplexed' at the expression of *"anxieties which it is not usual to hear"* (Welsh 2000: 63). At the Bradwell in early 1956 the local MP reported that the safety issue had been *"worrying local residents more than anything"* (Luckin 1990: 174) while at the Inquiry the everyday fears and suspicions of the objectors were dismissed as 'unreal' by the Inspector. As Welsh commented *"The concerns of the objectors which had been expressed in such impassioned terms were thus defined away as being real only within the confines of the Inquiry. Subjected to the rigours of the 'real world' they would dissolve away into 'unreality' "* (Welsh 2000: 79).

At the next Inquiry at Hunterston in early 1957 fears about safety, due to the hazards of radiation, were also raised. Welsh comments that the Bradwell and Hunterston inquiries (2000: 89):

*"... make it quite clear that public apprehension over reactor safety and radiation hazards existed during this period. It is also clear that the adequacy and legitimacy of the inquiry system was strongly questioned. The broad similarity of issues at these inquiries indicates that these were generalised anxieties and not merely expressions arising from particular instances"*.

These anxieties of the public persisted throughout the 1960s and at Stourport in 1970 the CEGB were still dismissing fears of radioactive dangers. Moreover its refusal to acknowledge resident's fears on nuclear safety and the dangers of radioactivity, made it impossible for it to shake off its reputation as an unresponsive and aloof organization. Furthermore its inability to provide a convincing answer to the frequently asked question (dating back at least to the first nuclear



Inquiry at Bradwell in 1956) of why, if nuclear power stations were so safe, were they built in remote areas? And why were there such detailed emergency measures in the event of any release of radioactivity?

During the campaign at Stourport letter writers raises the issue of nuclear safety, with one mentioning the Windscale accident of 1957. This theme of fear about nuclear safety dominated the campaign, despite reassurances from experts engaged by the County Council. Cllr. Eric Higgs, the secretary of the APS, the anti nuclear power station committee, was stated as saying *"We are objecting because we do not want this in Stourport. There will always be an element of fear, and we don't want to live with it"* (KT&NS 5 June 1970). This fear of radiation was a dominant theme. Cllr Betty Gazard, a prime mover behind the campaign, said *"None of us know how much we shall receive, or if we shall receive any or if it will do us any harm"* (KT&NS 5 June 1970).

So what was the roots of these anxieties and fears?

### 6.3 Weart's 'Nuclear fear'

Spencer Weart uses the term 'nuclear fear' to explain opposition to nuclear power, and in his opinion this fear was heavily influenced by images of the nuclear bomb in popular culture. The bomb had become a very powerful symbol of mass destruction, the apocalypse, and a world ruined by radiation. It had also become associated with myths of 'technology out of control', of 'mad and bad' scientists experimenting with things 'best left unknown', and of control of nature and mankind by a remote elite. Atomic energy had become the cliché of every SF horror stories: of mutant insects caused by radiation, of death rays created by the evil scientist bent on world control, of the crazed military officer launching a surprise nuclear strike, or of bureaucratic utilities ignoring nuclear safety problems. The emerging environmental movement was able to (perhaps unexpectedly) capitalize on these highly emotional images when it got involved in local campaigns against the building of nuclear power plants. Weart comments *"Nuclear fear was by no means the only form of imagery; let alone the only social force, behind the environmental movement. But nuclear fear took a special place. It raised emotions earlier and on a more visceral level than any other issue. And it served as a banner that could rally everyone around"* (Weart 1988: 325).

This nuclear fear was recognized by early analysts of the US anti-nuclear movement. For instance Ebbin and Kasper (1974) argued that the concerns that induced opposition to a nuclear power station was based on more than simply environmental issues. They remarked *"Fear of things nuclear or atomic is not uncommon among the population in general and intervenor groups in particular: fear of nuclear accidents, fear of radiation exposure, fear of propinquity*



to nuclear plants, fear of long range unknowns, fear of technological error and commitment to a technology imperfectly understood" (Ebbin and Kasper 1974: 17). They remarked that this fear had an evident historical foundation, as most adult Americans were first made aware of nuclear power with the dropping of the atomic bomb. The image of the mushroom shaped cloud, they concluded, "*remains clear and frightening in the minds of the American public*" (Ebbin and Kasper 1974: 17).

### 6.3.1 The WHO Study Group

This nuclear fear was recognized early on by the nuclear authorities, and in 1957 the World Health Organisation (WHO) set up a Study Group on 'Mental Health Aspects of the Peaceful Uses of Atomic Energy', and an account of its workings is given by one of its members, Ritchie Calder, then a science journalist.<sup>79</sup> Calder wrote that the Study group sought to change the 'irrational and deplorable' fear of science meddling with things which would be better left alone, or in other words to "*seek to enthrone reason and rebut the New Superstition*" (Calder 1962: 23). The WHO Study Group made clear that by 'mental' it meant 'emotional' and Calder wrote that to it (Calder 1962: 23):

*"...certain disturbing features became plain. One was the universal disquiet about atomic energy, in terms not only of its potentialities for destruction in a nuclear war but of its peacetime implications ....civilized man tends to cower, like the Neanderthal forefathers, in the dark cave of his emotions. We are back in the 'childhood of mankind'. Man's anxiety about his own search for knowledge and power is reflected almost universally in myth and legend and still lurks in our own nature today".*

These myths and legends, such as those of Pandora and Faust, were renewed in SF films and novels of the 1950s, about the radiation from the atomic bomb creating mutated creatures that would wreck destruction on mankind (as in the highly popular 1954 film *Them!* on giant killer ants). The WHO Study group sought to explain this fear "*that trespassing in the Unknown will invite a kind of cosmic revenge on mankind*" in psychological terms as the tendency to relapse into more primitive forms of thought and feeling known as 'regression'. As Calder reported "*The psychologists also have an explanation for the universal fear of 'fallout' and atomic waste. These are associated with feeding and excretion. The danger to food is generally the most disquieting concern about fallout or the risks of a nuclear mishap and, so the psychologists say, there is a symbolic association between atomic waste and body waste*" (Calder 1962: 24). This fear of contamination of food was used by opponents of nuclear bomb testing in the late 1950s, when they campaigned on the issue of radioactive strontium-90 in milk. This radioactive fallout threat to milk was also used in 1963 by campaigners against a nuclear plant at Bodega Bay, an



issue that particularly appealed to women (Wellock 1998: 47). Such campaigns exploited deep seated myths of milk as the most sacred of food, and as Weart observed since the time of witchcraft trials, accusations of obscene attacks on milk have been a powerful weapons against enemies (1988: 214).<sup>80</sup> Weart also agrees on the psychological importance of atomic wastes being viewed as excrement suggesting that, on every level of human thought, radioactive wastes - in association with weapons- were seen as *“filthy insults against the proper order of things”* (Weart 1988: 298).

### 6.3.2 Linking bombs and nukes

The linkage in the public mind between atomic bombs and power had always been strong, and anti-nuclear power campaigning could be seen as a substitute for the failed earlier attempts to rid the world of nuclear weapons. The hostility to nuclear weapons sought an easier outlet: what psychologists would call ‘displacement’, a hostility that shrinks away from what is too threatening, directing itself onto some other target instead (Weart 1988: 212). This can be considered as a rational response to an insoluble problem, just as the 1950s campaign by Linus Pauling’s and others against atomic fallout, hid their primary goal of reducing the likelihood of the use of atomic bombs.

Similarly in the 1970s David Lilienthal, a veteran of the attempt to control the arms race, remarked that people were attacking reactors as a ‘surrogate for bombs’ (1980: 22-23). Weart comments that the fear and hostility previously directed towards bombs was now directed onto nuclear power, and this displacement became clear to him when one person remarked to him *“I can’t do anything about the bomb, but I can do something about reactors”* (Weart 1988: 323). Initially in the 1970s the anti-bomb (or peace) movement and the anti-nuclear power movement were distinct, due to style, tactics and differing constituencies. The peace movement argued that the problems of nuclear power were simply trivial compared to the dangers of nuclear war, while the anti-nuclear movement was reluctant to compromise its ‘political neutrality’ by campaigning on an issue that had strong pacifist and left links (Nelkin 1981). In the UK most campaigners did not link nuclear power to nuclear weapons until the early 1980s when hundreds of local groups networked in the Anti-Nuclear Campaign (ANC) joined together with a revigorated CND to oppose both nuclear weapons and nuclear power (Webb 1980).

### 6.3.3 Mastery of Nature

The nuclear power reactor, to both supporters and opponents of technological progress, stood as a *“full symbolic representation of attempts by the forces of order to master nature”* (Weart 1988: 369). Weart goes on to explain that (1988: 369):



*“This symbolism can explain better than anything else why nuclear reactors were singled out, far more than any other technology, for utopian hopes on the one hand, fear and hostility on the other. In term of hierarchical control by a technical elite, reactors were not obviously worse than, for example the telecommunications industry; in terms of prospective hazards to our daily lives, reactors were not obviously worse than, for example, the chemicals industry. What reactors did offer that nothing else could match was a unitary image tying together everything involved in the battle between ‘nature’ and ‘culture’ ”.*

Environmentalists were at the heart of this battle against the mastery of ‘nature’, and thus the nuclear reactor became the prime symbol of this largely idealistic battle. Also reactors, as large objects which people could see as ‘blots on the landscape’, served as a very convenient concrete reality, in this ideological dispute about the direction and control of society. Thus the anti-nuclear power campaign was able to link local rural ‘NIMBY’ protests about the construction of large industrial projects with urban romanticism about the destruction of nature by technological elites.

#### 6.4 Why anti-nuke?

What converts the individual to protest about nuclear power, rather than a myriad of other worthwhile issues? Sometimes it comes as an almost religious conversion, the sudden association of nuclear reactors with nuclear weapons, as a life threatening technology. One example is the case of David Pesonen, a leader of the group opposing the building of a reactor at Bodega Bay in California, who had at first only opposed the reactor as an industrial object desecrating the shore. According to Sheldon Novick a chronicler of the fight against nuclear power in California, he was reflecting on the fight when he underwent a remarkable experience *“It was a beautiful evening, a touch of fog,”* Pesonen recalled. *“I had a feeling of the enormousness of what we were fighting; that it was antilife.”* It struck him that nuclear power was *“the ultimate brutality, short of nuclear weapons”* (Novick 1976: 241). From then afterwards he became a vigorous campaigner against all reactors, based on what Wellock calls ‘moral environmentalism’ (Wellock 1998: 48). Other times it is an aesthetic protest at the mutilation of the landscape, drawing on moral outrage over the degradation of the countryside dating back to childhood days.<sup>81</sup> One such case is that of Langdon Winner, who in the final chapter of his book *The Whale and the Reactor*, musing on the cultural and political significance of the Diablo Canyon nuclear power plant, wrote *“To put the matter bluntly, in that place, on that beach, against those rocks, mountains, sands and seas the power plant at Diablo Canyon is simply a hideous mistake. It is out of place, out of proportion, out of reason. It stands as a permanent insult to its natural and cultural surroundings”* (Winner 1986: 176).



#### 6.4.1 Schumacher's Ethical critique

The most articulate voice against nuclear power in Britain was Fritz Schumacher, who had long been opposed to nuclear power on ethical grounds. In a 1955 essay *Economics in a Buddhist Country*<sup>82</sup>, he called it 'violence against nature' and described "*Atomic energy for 'peaceful purposes' on a scale calculated to replace coal and oil, is a prospect even more appalling than the Atomic or Hydrogen bomb*" (quoted in Wood 1984: 304). His longstanding views on nuclear energy found a forum at the National Society for Clean Air conference in October 1967 where he argued that "*of all the changes introduced by man into the household of nature, large scale nuclear fission is undoubtedly the most dangerous and profound. As a result ionizing radiation has become the most serious threat to man's survival on earth*" (Schumacher 1967a).<sup>83</sup> Furthermore highly controversially he said that nuclear stations "*represent an incredible, incomparable, and unique hazard for human life [that] does not enter any calculations and is never mentioned*" (Times 1967).

Schumacher identified nuclear waste disposal as a key problem (Times 1967; slightly different text in Schumacher 1973a: 126-7):

*"No place on earth could be shown to be safe from radioactive waste products...The most massive wastes are of course the radioactive reactors themselves...No one discusses the humanly vital point that they have to be left standing where they are, perhaps for thousands of years, an active menace to life silently leaking radioactivity into air, water and soil. No one has considered the number and location of these satanic mills which will relentlessly accumulate in the crowded islands so that after a generation or two there will be no habitation outside their 'sphere of influence' of one or more of them".*

As Geoffrey Kirk, his assistant at the NCB, remarked "*The response to his lecture was immediate and angry. Officialdom was outraged. He was accused of having spoken irresponsibly and of being guilty of special pleading. There was a public rebuke by the Ministry of Power, Richard Marsh*" (Kirk 1982: xiii). In a letter to The Times on 25 October 1967 he defended his speech, and stressed that economic consideration should not have primacy over environmental ones. He wrote (Schumacher 1967b):

*"I ventured to suggest that economic considerations must not automatically be accepted as decisive in such a case...there is no need to hurry to change from conventional power stations to nuclear stations.*

*I am not alone in taking the view that - in the absence of necessity - even a small amount of genetic damage cannot be justified or excused by economic considerations."*



Schumacher was a supporter of the conservationist arguments on the need to conserve natural resources and to respect nature (see Conford 2001: 212). This conservation position was expressed in 1962 when he stated (Schumacher 1962; reprinted in Kirk 1982:10):

*“Even with renewable primary products, man is not wholly in control of the productive process as he is in a factory but first must fit his actions into the rhythm of the seasons and the often mysterious requirements of organic life. His responsibility cannot be confined to making ends meet and maintaining his man-made assets: he must also ‘conserve’ the natural conditions which make primary production possible. Thus he has to conserve soil fertility, to conserve forests, to conserve fish populations, and so on”.*

His use of words, ‘organic life’ and ‘rhythm of the seasons’ are, perhaps, the influence of Soil Association which he joined in the early 1950s. According to his daughter, Barbara Wood, he was strongly influenced by their ideas on organic agriculture, and ‘wholeness’ and health in the broadest sense and *“His eyes were opened to a whole new way of thinking”* (Wood 1984: 221, 237). He eventually became their President in 1970. Thus in his 1967 speech he used their language and philosophy of conservation ethics when he said (Schumacher 1967a):

*“In the blind pursuit of immediate monetary gains modern man has not only divorced himself from nature by an excessive and hurtful degree of urbanisation, he has also abandoned the idea of living in harmony with the myriad forms of plant and animal life on which his own survival depends; he has developed chemical substances which are unknown to nature... The religion of economics... promotes an idolatry of rapid change... The burden of proof is placed on those who take the ‘ecological viewpoint’ ”.*

The publication of his book *Small is Beautiful* in 1973 bought him much publicity for his ethical views and he concludes his chapter on nuclear energy with a restatement of his 1967 position on the need for the supremacy of ethical over economic values (1973a: 135):

*“No degree of prosperity could justify the accumulation of large amounts of highly toxic substances which nobody knows how to make ‘safe’ and which remain an incalculable danger to the whole of creation for historical or even geological ages. To do such a thing is a transgression against life itself, a transgression infinitely more serious than any crime ever perpetrated by man. The idea that civilisation could sustain itself on the basis of such a transgression is an ethical, spiritual and metaphysical monstrosity”.*

Schumacher's ideas that nuclear power was a ‘transgression against life itself’ chimed in with popular concerns about the effect of radiation on future generations. During the Stourport campaign a local headmaster, Mr. Baylis, said *“There are some people in Stourport who have not been consulted - the children. If we hand this down to the children of Stourport as a*



*heritage, we shall have done them a great deal of harm*" (KT&NS 5 June 1970). This concern was also articulated in 1972 by Jon Tinker, in a talk on BBC radio, who described the problem of radioactive waste and said there was no safe way of disposing of it. He vividly warned that *"This devils broth can never be released, for it contains more radioactivity than a dozen H-bombs... What sort of environmental legacy is that for our children and grand-children?"* (Tinker 1972: 5). This moral issue of intergenerational equity featured in the anti-nuclear arguments made by Beryl Kemp, leader of the ConSoc campaign, who stated in letter to the newsletter *"The moral issue has been the basis of the campaign which Jane Pink and I (and our supporters) have run for the last year or more. Even if the risks were acceptable to us, we consider that we have no right to endanger future generations in order to preserve our own high living standards"* (Kemp 1976a).

This ethical approach again featured in a 'letter of concern' which appeared in The Guardian on 7 January 1975, with 43 signatories, including those of E.F. Schumacher, Bishop Hugh Montefiore, and Peter Hain. The letter stated *"Our nuclear power programme represents a Faustian bargain in which we are jeopardising the safety of future generations and their environment for our own short-term energy benefits... We consider it is immoral and unwise to pursue a technology which will leave such a dangerous legacy to posterity"* (Bryce Smith et al 1975).

#### 6.4.2 Against the 'Other'

However by the mid 1970s, many leading anti-nuclear intellectuals opposed nuclear power not on environmental or ethical grounds, but because it was promoted by arrogant and secretive institutions: the 'Other' (see section 5.3.2). Peter Chapman, in an interview with the author in 1998, remarked *"What got me was the stupidity and arrogance of the industry. It was the people not the technology I was opposed to. It was the scientific stupidity of their claims it was safe, that there was no problems, like waste disposal. They had no basis for such claims. Gofman really impressed me, his claims that there was no such thing as a safe level of radiation"* (Chapman 1998).

Gerald Leach, an observer of the nuclear scene in the 1970s, attributes the motivation behind many of the anti-nukes to dislike of large scale institutions, and the threat of the 'nuclear state'. Nuclear power, he believed, invited attack as it was *"an attractive target for anti-authoritarians"* being arrogant, secretive, and insensitive (Leach 1996). This was true for Robin Grove-White, an early environmental activist, who was motivated by his dislike of the 'nuclear state' and its threat to civil liberties. What irked him was the *"CEGB arrogance of assuming they could do whatever they liked."* (Grove-White 1996). Another anti-nuke campaigner, Brian Wynne, became



involved because he had no confidence in the CEGB's energy projections or forecasting methods: he believed that they had 'no intellectual substance' and were 'anti-democratic' (Wynne 1996).

The most vocal and widely publicized criticism of the nuclear industry came from Walt Patterson. It centred more on a critique of the electricity supply industry (principally the CEGB) as a powerful, monolithic, and undemocratic institution than on environmental issues of nuclear power (Patterson 1977). According to Patterson, political opposition to the CEGB, coalesced in the anti-nuclear movement because nuclear power was 'a big, easy and unifying target' (Patterson 1996). He believed that nuclear power was vulnerable because it was 'big, arrogant, and powerful', and could be overthrown in a 'David versus Goliath struggle'.

In an interview with the author he said "*The nuclear industry was its own worst enemy. In the 1950s and 1960s there was boundless enthusiasm for it, the public swallowed every extravagant claim they made, which all proved wrong. Nuclear was given a start no other technology has enjoyed*" (Patterson 1996). He believed that nuclear power had built itself up with myths: of Man confronting and overcoming Nature, of exploring the deepest secrets of nature, and of nuclear physics as so esoteric and full of powerful secrets that it was fit only for the Weinberg idea of an elite 'nuclear priesthood'. Patterson aimed to debunk this mysticism with his book *Nuclear Power* (1976) and explained (Patterson 1996):

*"The nuclear establishment couldn't be trusted. Up till then it was taken as law that only they could understand nuclear power. My book, Nuclear Power, dispelled the aura of mystery, it had a big impact. I argued from the onset that there was nothing complex about nuclear, no more than TV, you didn't have to understand how it worked to have opinions on its use. This changed the tenor of the debate. It demystified the experts, they were then seen as overstating and misstating their case".<sup>84</sup>*

Finally Gerald Foley, a more detached observer of the nuclear scene in the 1970s, laid the blame on nuclear's unpopularity to its delusion caused by dreams of nuclear grandeur. In an interview with the author in 1996 he commented "*I was most unimpressed by the whole nuclear establishment. They were not malevolent but just self serving as others are, they were well meaning but had delusions*" (Foley 1996).

Thus there was a divergence in concerns between local people (and old style conservationists) opposed to nuclear power and the new movement intellectuals. For instance at a rally in 1976 at Barrow residents demanded reassurances about possible hazards associated with the transport of radioactive materials through the town, while FoE expressed more concern about more remote

issues of plutonium security, proliferation implications, and the economic validity of the reprocessing industry (Patterson 1976a).

## 6.5 Recruiting anti-nuke activists

Why do people become anti-nuclear power activists? How are they recruited? Do they start off as environmentalists, and then become anti-nukes? Why do only a small minority of those with an anti-nuclear attitude decide to protest. These questions are a subject of much fascination to academics and there are diverse theories on 'new social movements' and 'activist identity' used to explain why people become activists. But as Wall comments these theories that imply that *"identity grows from a single factor such as class or upbringing or whatever, are inadequate"*, and that they fail to *"indicate why the majority of surveyed individuals who, due to such traits, can be thus classified as potential activists fail to become involved"* (Wall 1999: 96). An alternative approach on activist recruitment stresses the importance of 'friendship networks' that encourage uncommitted or disinterested individuals to participate in protest activities. Douglas McAdam gives the following example (1986: 68-9):

*"Imagine...the case of a college student who is urged by his friends to attend a large 'anti-nuke' rally on campus. In deciding whether to attend, the potential recruit is likely to weigh the risks of disappointing or losing the respect of his friends against the personal risks of participation. Given the relatively low cost and risks associated with the rally, this hypothetical recruit is likely to attend, even if he is fairly apathetic about the issues in question"*.

The use of social networks to recruit activists to a particular cause was found by Alan Mazur who notes that *"several studies of recent social-protest movements indicate that recruitment often occurs along pre-existing social links, and that people frequently join in an organizational block rather than as isolated individuals"* (Mazur 1981: 58). In his interviews in 1973 with 30 leaders of the Consolidated National Intervenors, the coalition that had opposed the AEC in the hearings over the ECCS (emergency core cooling systems), Mazur found that two-thirds had been in environmental groups (1975: 68). These leaders were usually mature, middle-class liberals who initially had no specific dislike of nuclear power. Their concerns had developed largely through their participation in local environmental groups against the building of a large industrial plant - the nuclear power station - in an area of high scenic value, such as the Californian coastline. Mazur wrote (1981: 58):



*"Half of these environmentalists explicitly reported that their concerns had been influenced by other anti-nuclear people with whom they had come into personal contact. A few non-environmentalists were introduced into antinuclear groups through friends... Only a few respondents formed their anti-nuclear alignment completely independently of important social influences".*

Mazur even found that the opinion of academics on nuclear issues is related to the social networks which exist within the academic science community. He concluded *"The political judgement of scientists are shaped by their social milieus, just as those of laymen"* (Mazur 1981: 81). A large proportion of the one fifth of the population that polls showed were always hostile to nuclear power were opposed to the degradation of the environment and corporate control of society. Mazur noted that the left orientation of the opponents of nuclear power plants could be observed as early as 1956, and *"that liberals were more likely than conservatives to find the anti-nuclear issue appealing, and were more likely to be recruited by the early liberal activists"* (Mazur 1981: 47). There is a long tradition within the left, encouraged by its ideology of collective rather than individual action, of individuals banding together to form campaigning groups which can combine to form a mass movement. As Mazur remarked *"The options usually available to someone who wants to express his concerns are limited: either waste one's efforts on solitary protest with little chance of success or join a currently-running protest movement and pool resources with other sympathetic souls"* (Mazur 1981: 96).

#### **6.5.1 The anti-nuke movement in the US**

The anti-nuclear movement in the US arose partly due to policy decisions made by the nuclear industry, which alienated some of its traditional supporters, but mostly due to external changes in society that turned passive acceptance of nuclear into open hostility for a significant minority of the population. The policy decisions made by the nuclear industry were typical of any maturing technological industry as bureaucrats take over from scientists, and as the profit motive replaces early idealism. As the industry matured and more reactors came on line, the emphasis was now on regulation rather than research, on every day safety rather than hypothetical accidents, and on consensus rather than critical inquiry. Nuclear scientists were no longer in control of a technology they had created, and those scientists who fell foul of the bureaucratic line were often eased out of the industry, to sometimes become embittered and highly vocal critics, such as John Gofman and Arthur Tamplin (Weart 1988: 316). However the nuclear industry has since its birth always had its critics, often ex members of staff, but their criticism rarely reached the public. Why did the public suddenly want to listen to nuclear critics from the late 1960s?



### 6.5.2 The Critics speak out

Activists in the small anti-nuclear minority in public opinion may have taken the opportunity of the absence of nuclear power articles in magazines, in the mid to late 1960s, as an opportunity to speak out, as previously their voices would have been drowned out by nuclear optimists. Also after a dearth of nuclear articles, magazines may have welcomed a new opinion, a fresh approach to the hackneyed subject of the wonderful benefits of the peaceful uses of nuclear energy which filled pages of magazines in the late 1950s. Particularly at a time of national debate over nuclear weapons centering around the Anti Ballistic Missile (ABM) programme. Ernest Sternglass used a novel approach, in his controversial article 'The Death of All Children' in the mass circulation magazine Esquire in September 1969, of linking the dangers of radiation from nuclear weapons tests to high rates of infant mortality. He achieved wide publicity for his radiation statistics claims, even though they were rapidly discredited by nuclear scientists who were disgusted by his attacks and who were encouraged by the AEC to refute him. As a contemporary article about him remarked "*Indeed for a man who is so widely regarded as wrong, Sternglass has achieved surprising exposure on the nation's airwaves and in the mass media*" (Boffey 1969: 195). <sup>45</sup> However as Weart commented (1988: 313):

*"While the experts were dismissing Sternglass, ordinary citizens who read his statements or saw him on television could not be so sure. He was a physics professor, just like others who were arguing plausibly against the ABM. He was also a good performer, making his points clearly and persuasively. When he and an AEC expert each had a few minutes to present opposing views on a television show, it was impossible to tell who was right".*

Philip Boffey (1969) in his profile on Sternglass asked how he could achieve such wide exposure for his views when so many scientists believe he is wrong. Part of the answer, Boffey wrote, probably lies in the fact that Sternglass made good press copy - he had a startling theory that relates to important public issue. Furthermore Sternglass "*is in tune with a number of deep public moods - the revulsion against the military, the desire to end contamination of the environment, and the tendency to disbelieve the rosy reports emanating from government agencies*" (Boffey 1969: 199). Scepticism about the impartiality of government agencies was further reinforced by the AEC's treatment of two of its employees, John Gofman and Arthur Tamplin, at its Livermore Laboratory in California. Gofman, as an expert on the radiological impact of biologically absorbed plutonium and the leader of a health research program, had been asked to review Sternglass' Esquire article, and had enlisted the aid of Tamplin. But Tamplin's report, defended internally by Gofman, did not please the AEC, even though it did reduce the number of infant deaths a hundred fold from 400,000 to 4,000, but the AEC "*found*



*the number still too high for its public image*” (Bertell 1985: 231). As Weart commented *“Like any bureaucracy, the AEC disliked doubters within its own ranks, and the pair found themselves increasingly unwelcome at Livermore”* (Weart 1988: 315).<sup>86</sup> However Gofman was a natural rebel who despised government authority in general, and was happy to fight against the bureaucrats of the AEC over the impact of low level radiation from nuclear reactors. Challenging the claims that reactors were ‘absolutely safe’ Gofman and Tamplin toured the nation, giving talks and interviews to warn against materials routinely emitted by reactors, and to promote their 1970 book *“Population Control” through Nuclear Pollution* (Weart 1988: 315). Gofman and Tamplin built upon the worries that Sternglass had originally provoked, and received generally favourable media coverage especially on TV. On one TV documentary ‘Powers that Be’, broadcast on 18 May 1971 in Los Angeles, Weart remarked *“Viewers were left with the thought that, as narrator Jack Lemmon put it, “nuclear power is not only dirty and undependable ...it’s about as safe as a closetful of cobras”* (Weart 1988: 315). Against such anti nuclear propaganda the AEC was steadily losing ‘the battle of images’. It was also losing the scientific debate over threshold doses of radiation and in 1971 the AEC were forced to reduce the maximum permitted dose that a reactor could emit.

### **6.5.3 Anti-war radicals turn anti-nuke**

The criticism of the AEC must be seen in the context of radical student protest against the Vietnam War and anything that smacked of the ‘military-industrial complex’. It was an easy step to move from protesting about bombs and missiles to reactors, and as public interest in the ABM proposals faded away in late 1969, groups such as the Union of Concerned Scientists (UCS) and the Scientists’ Institute for Public Information looked around for a new issue. They found it in local protest to the siting of nuclear power plants. The UCS was originally a group of Boston based scientists and students, who had come together in 1969 against the ABM and the military uses of academic research, and who wanted to affect ‘an ideological change in society’ through more democratic control of science and technology (Downey 1986). After the ABM protest faded away membership declined but some were drawn into controversy over a proposed nuclear site near Boston. One such member was Daniel Ford, then an economics graduate student at Harvard, who got involved in research over the safety of emergency core cooling systems (ECCS). In July 1971 the UCS published a report exposing the inadequacies of, and the internal dissent, over the ECCS, which attracted widespread media coverage (Weart 1988: 319). Hoping to answer this new public criticism, the AEC opened public hearings on ECCS in January 1972 that were planned to last just six weeks but extended, with interruptions, well over a year. Robert Gillette, in a series of four articles in Science, traced the roots of the safety issue



*“to problems of the management of the nuclear safety program, and to an intense discord that has developed between the AEC and its national laboratories”* (Gillette 1972: 771). This discord and the adverse publicity it received over its stifling of internal dissent and its scornful dismissal of external critics fatally weakened the AEC’s authority and credibility. Its behaviour only reinforced people’s suspicions about it being a powerful and arrogant bureaucracy or what Peter Metzger (1972) called an ‘atomic establishment’. Even the industry trade journal, Nucleonics Week, noted that the hearings *“have opened up a Pandora’s box of scientific doubts and bureaucratic heavyhandedness”*.<sup>87</sup>

Daniel Ford wrote of this era that *“The Vietnam war protests had prompted widespread attacks on ‘Establishment’ endeavours”* and *“The legal challenges to the nuclear power program were being raised by individual citizen activists, local and national government organisations, ‘public interest’ law firms, and ad-hoc groups opposed to the siting of nuclear power stations in their locality”* (Ford 1982: 116). One example of a ‘public-interest’ group was the Scientists’ Institute for Public Information, in St. Louis led by Barry Commoner which in 1971 brought a lawsuit against AEC’s breeder reactor program. Their critique was summarized in the first methodically argued and widely read anti-nuke book, *The Careless Atom*, published in 1969 by a Commoner protege, Sheldon Novick. Most other organizations that opposed reactors similarly drew much of their strength from individuals and groups who had first fought the AEC over weapons (Nelkin 1981). This crossover from weapons to reactors was common, and as Weart remembers *“In the coffeehouses where students gathered in the early 1970s, bulletin board posters opposing the Vietnam War and the ABM were covered over with notices of meetings to protest reactors”* (Weart 1988: 321).<sup>88</sup> This mobilization of activist groups is shown by the formation of the Consolidated Nuclear Intervenors, a coalition of more than sixty *“environmental groups fighting against the nuclear reactor program on safety issues”*, who challenged the AEC, during the ECCS hearings, using the technical evidence of Henry Kendall and Daniel Ford (Berger 1977: 47).

The growing anti-nuclear movement was also greatly helped by the willingness of usually pro-nuclear papers, such as the New York Times, to give space to stories questioning the competence and credibility of the AEC. This was done using the Freedom of Information Act to force the AEC to disclose secret documents, which were then passed onto friendly journalists. David Burnham, a New York Times, reporter who covered the UCS campaign on the ECCS, remembered two decades later (Weart 1988: 378 n10):

*“Henry Kendall and Dan Ford came up with a brilliant way of using the media in their nuclear safety work. They knew that a reporter... could not directly challenge the assertions*



*of organized physicists or engineers that the nation's nuclear power program was a dream come true. But a reporter could write about the administrative problems of the nuclear program, providing there was documentary evidence".*

Thus the anti-nuclear critics saw the weak point of the nuclear program as its administrative, not its technical, record and knew this would appealed to the 'muckraking' tradition of US journalism. As Daniel Ford put it *"Having regarded the nuclear program uncritically for two decades, the news media detected the scent of a potential scandal, which in the normal course of events it would be likely to dramatise and to build into an even bigger controversy"* (Ford 1982: 134). As David Burnham remarked (Weart 1988: 378 n10):

*"These documents gave me- as a reporter for the New York Times the hook that was required to persuade the editors that there might be a problem with nuclear energy. Since the Times had always been a true-blue believer in science, technology, and progress, Henry and Dan's achievement- finding the evidence that persuaded the paper to print stories questioning nuclear power - was a prodigious feat".<sup>89</sup>*

By the early 1970s the AEC was worried by the increasingly successful tactics of the vocal minority who were opposing nuclear-plant construction, and the negative tone of much nuclear power coverage in the mass media. The fiasco for the AEC of the ECCS hearing during 1972 deepened its crisis of confidence, and encouraged its internal critics to speak out. As Cohn remarked *"The long public airing of the ECCS controversy helped legitimize the private doubts of many technocrats within the AEC and nuclear industry and helped induce a flow of leaked documents and protest resignations"* (Cohn 1997: 379). The credibility of the AEC continued to decline with calls by its critics for its dismemberment. This was achieved in 1974, when Congress split the promotion and regulation of nuclear technology into two agencies, and also stripped the powerful Joint Committee on Atomic Energy of its unique powers. This was a major victory for the anti-nukes and as Weart commented *"Nuclear energy lost its strongest institutional supporters"* (Weart 1988: 346).

This success for the anti-nuke movement also attracted professional activists, those who saw the opportunity for their organizations to take advantage of an increasingly popular issue.<sup>90</sup>

Typical of this was Ralph Nader, a crusader against the hidden evils of industry and government and in 1970 more concerned with air pollution from oil and coal than hazards from nuclear power (Weart 1988: 326). But by late 1972, after the publicity over the warnings on radiation by Gofman and Tamplin and the AEC machinations at the ECCS hearings, he had become convinced that in nuclear power the public faced another official 'cover-up' of hazards. So he convened a national conference in late 1974 that brought together more than a thousand anti-

nuke campaigners, which according to a journalist attending “*had the grim flavour and messianic fervor of the movement to end the war in Vietnam*” (Olson 1975).<sup>91</sup>

#### 6.5.4 UK imports US expertise

Anti-nuclear arguments in the United States were rapidly transmitted to Britain by the media, and used in British debates over the safety of nuclear power. The work of Gofman and Tamplin was used by consultants working for Worcestershire County Council in its opposition to a proposed reactor at Stourport in 1970, though they were keen to distance themselves from the claims of Sternglass (see section 2.4.7). The consultants state (Leslie & Shaw 1970: Volume 3: 4):

*“Gofman & Tamplin are responsible people... and should not to be confused with Prof. Sternglass, who recently got a lot of publicity for his views that bomb tests had killed hundreds of thousands of children. Our colleagues are unanimous that the statistics will not bear the interpretations which Sternglass is trying to put on them”.*

The influence of American anti-nuclear works was also evident in remarks by another consultant to the Council when he said, most probably referring to Sternglass’ claim (Spiers 1970a):

*“I believe Windscale-type accidents are unlikely or impossible with the present closed circuit type of reactor, but I imagine some kind of accidental escape is conceivable and I imagine the Council to be concerned about this, particularly in view of the recently renewed press and TV discussions on radiation dangers”.*<sup>92</sup>

The work of Gofman and Tamplin on safety was quoted heavily in a BBC TV documentary ‘A Question of Survival’ broadcast on 14 December 1971. This broadcast, later criticised in the technical press, is one of the key events to which Pocock attributes the start in 1972 of “*well organized and well publicized opposition to plans for the expansion of nuclear power in Great Britain*” (Pocock 1977: 227).

Pocock is certainly wrong here, an effective opposition did not emerge until 1975; but by 1972 movement intellectuals, such as Walt Patterson and Peter Bunyard, had since 1970 been articulating and publicizing reasons for opposition to nuclear power in their magazines Your Environment and The Ecologist. Patterson was in a unique position to do, as he had reported on the 1972 ECCS hearings, so was able to import all the US debate.

Opposition to nuclear power amongst movement intellectuals was fuelled not so much as by ‘nuclear fear’, than by the growing realization that nuclear power was not going to be the utopian energy source - the answer to the world’s energy problems - that pro-nuclear intellectuals like Alvin Weinberg had promoted. Thus John Davoll, in his views on nuclear



power, not only highlighted the problems of the rapidly growing stockpile of long-lived, indestructible and highly toxic radioactive wastes but also wrote that (ConSoc 1975: 15):

*“detailed proposals for a world nuclear economy, by Alvin Weinberg and others ...only undermine forcibly how completely it commits humanity to maintaining a complex and hazardous system... Nor does nuclear power, on careful examination, show promise of being cheap or being able to mitigate the impending confrontation between rich and poor countries”.*

This rejection of nuclear power as a utopian energy source is covered in the next chapter.

## **7. Energy Utopianism: the search for a perfect energy source**

One person's utopia is, as many commentators have pointed out, another person's hell. The same dichotomy is also true for new energy technologies which tend to be launched on the basis of zealous commitments and grand projections of changing society. This chapter thus looks at the tendency of promoters of new energy technologies to attach utopian attributes to them, a characteristic Basalla (1982) has termed 'energy utopianism'. The first section examines the nature and dangers of this utopianism, outlining the views of Basalla on the dangers of energy myths, Luckin (1990) on electricity 'triumphalism' in the interwar period, and the early criticism of 'electro-proganda' by Carey & Qurk (1970). It then explores the notion of 'techno-arcadia', the interwar idea that electricity could revitalize the countryside and how this resulted in rural opposition to 'the march of the pylons' in Britain in the 1920s. The second section examines the myths surrounding atomic power dating back to the early 20th century, and how vision of an atomic utopia reached a peak in the US in the early 1940s, before being diminished by the realities of the atomic bomb in 1945, but with a resurgence from the mid 1950s with the propaganda of 'Atoms for Peace'. It concludes with comments from Cohn (1997) and others on why the nuclear dream failed. The third section looks at longstanding hopes of utopias powered by the sun (or what is now termed 'renewable energy'), particularly strong pre WW1. However post WW2 hopes for solar were dashed by government backing for atomic energy, and solar energy was only revitalized by the AT (alternative technology) movement from the late 1960s.

### **7.1 Energy and Society**

The tendency to attach utopian attributes to new technologies has been widespread particularly in American society. One American writer on technology, Langdon Winner, remarked that it is a recurring fantasy in industrial society that a new technology will end people's alienation from the current centralized political and technological system. Winner wrote (1986: 96):

*"Dreams of instant liberation from centralized social control have accompanied virtually every important new technological system introduced during the past century and a half. The emancipation proposed by decentralist philosophers as a deliberate goal requiring long, arduous social struggle has been upheld by technological optimists as a condition to be realized simply by adopting a new gadget".*

Winner talks about a great tradition of optimistic technophilia and remarked (1986: 106):

*"It is not uncommon for the advent of a new technology to provide an occasion for flights of utopian fancy. During the last two centuries the factory system, railroads, telephone,*



*electricity, automobile, airplane, radio, television and nuclear power have all figured prominently in the belief that a new and glorious age was about to begin”.*

This belief in the liberating power of new technologies was common amongst intellectuals and writers in the 1930s. Lewis Mumford believed that there could be a return to nature by way of modern technology, and in his 1938 book, *The Culture of Cities*, according to his biographers the Hughes he “*waxes lyrically about the liberating qualities of electric power lines, aluminum, radios, automobiles, superhighways and planes*” (Hughes and Hughes 1990: 108). This technological utopianism is beyond the scope of this thesis but is discussed in great detail by Howard Segal (1985) who examines the historical phenomenon of an uncritical faith in technology's ability to solve all problems, and David Nye (1994; 1998) who provides a cultural history of American relationships with technology and energy use.

It is therefore no surprise that supporters of new energy technologies, from the steam engine to the solar cell, have since the mid 19th century proclaimed that these technologies could act as a motive force for desired social change and as a means of returning to a ‘cherished naturalistic bliss’. The discovery of electricity, in particular, gave birth to ideas of a new bond between nature and society, termed ‘the rhetoric of the electrical sublime’ and was appropriated by late Victorian writers, such as reformers (as in Howard’s *Garden Cities of Tomorrow*), by revolutionaries (as in Kropotkin’s *Fields, Factories and Workshops*) and in utopian science fiction (as in Bellamy’s *Looking Backward*). These ideas and images for new energy technologies were examined by George Basalla (1980; 1982), who termed it ‘energy utopianism’. For electricity they were termed ‘electricity triumphalism’ by Bill Luckin (1990) in Britain and the ‘mythos of the Electronic Revolution’ by James Carey and John Quirk in the US (1970).

#### **7.1.1 Basalla’s Energy utopianism**

In his 1982 essay ‘Some Persistent Energy Myths’ Basalla reviewed the history of the introduction of a new source of energy into society over the last two centuries and concluded there was a recurrent energy myth. He stated (Basalla 1982: 27):

*“...any newly discovered source of energy is assumed to be without faults, infinitely abundant, and to have the potential to affect utopian change in society. These myths persist until a new energy source is developed to the point that its drawbacks become apparent and the failure to establish a utopian society must be reluctantly admitted”.*

Social commentators, he believed, do not seem to learn from previous mistakes by over-enthusiasts, for the next source is not handled in a more restrained fashion. Basalla commented (1982: 28):

*“Instead, the recently discarded energy myths are resurrected and bestowed upon the newcomer. And so the cycle continues, with only the myths remaining unaltered while various sources of energy enter and leave the public spotlight: coal, hydropower, nuclear power and solar energy”.*

Basalla noted that these fantasies attached to energy use and production are shared by a wide section of society: technologists, capitalists, and the general public alike. Finally he concluded that *“Energy myths are particularly dangerous because they blind us to the realities of new energy sources by promising a golden land of the future and ignoring the real problems of today”* (Basalla 1982: 28).

Energy utopianism is strongly linked to social utopianism, the desire to create new forms of society based on using the latest technology to liberate people from work or to create mass wealth. Some SF writers saw the discovery and development of new energy sources as a means to power a ‘utopian’ society, or as often with ‘atomic energy’ the means by which society was destroyed. However most sf writers saw atomic energy as just a new source of unlimited power. As Brian Stapleford points it was not until the 1960s that SF (and most other writers) considered the possibility of energy shortages, before that the problem was of a society coping with unlimited energy resources (Clute and Nicholls 1999: 953-5). For further details of the treatment of atomic power by sf writers see section 6.1.

### **7.1.2 Electro-propaganda**

In the early 20th century the provision of electricity, particularly to rural areas, was seen as a key component of modernization and industrialization of society. This desire for electrification was perhaps most intense in the Soviet Union after the 1917 revolution, and Lenin enthusiastically declared in December 1920 at the Eight All-Russia Congress of Soviets that (Lenin 1920):

*“Communism is Soviet power plus the electrification of the whole country... only when the country has been electrified, and industry, agriculture and transport have been placed on the technical basis of modern large-scale industry, only then shall we be fully victorious”.*

Lenin’s view on the transforming merits of electrification found similar support in the United States. For instance, Joseph K. Hart, a professor of education, extolled in 1924 the liberation that electricity would bring (Hart 1924 <sup>93</sup>):

*“Centralization has claimed everything for a century: the results are apparent on every hand. But the reign of steam approached its end: a new stage in the industrial revolution comes on. Electric power, breaking away from its servitude to steam, is becoming independent. Electricity is a decentralizing form of power: it runs out over distributing lines*



*and subdivides to all the minutiae of life and need. Working with it, men feel the thrill of control and freedom once again”.*

These ideas were supported by Lewis Mumford, who together with other conservationists such as Gifford Pinchot, formed the Regional Planning Association of America around the goals of public electricity power and community planning which were adopted by the US Government during the 1930s, with the creation of the Tennessee Valley Authority (TVA) and the Rural Electrification Administration. This intense admiration and enthusiasm for electrification as the harbinger of modernization was widespread in all western countries, especially those that saw the state as the leading agent for social change through widespread planning. Bill Luckin, writing on the construction of the National Grid in Britain in the inter-war years, develops the concept of 'triumphalism', a progressive ideology that would overcome traditionalist thinking on technical change. He remarked that 'triumphalism' (Luckin 1990: 2):

*“...was grounded in the scientific premise that economy, society and culture would be rapidly and radically transformed by the new source of energy. Forged by electrical engineers, contractors, salesmen, journalists and technocrats, this progressivist ideology was buttressed by powerful state bureaucracies”.*

This rhetoric or 'electro-propaganda' from the technical press, like Electrical Review, promoted the image of the forthcoming 'golden age of electricity' to consumers, based on its association with 'progress', with a modern, middle-class lifestyle based on health, leisure and domestic appliances. As Luckin commented (1990: 20):

*“Electrical triumphalism was more than a generalised and at time a quasi-religious rhetoric, growing out of and molded by a deep defensive reaction to the existing technological order. It must be seen as the shaper and bearer of images which made up the 'public face' of electricity and which persuaded large numbers of the uncommitted to invest, symbolically as much as economically, in the 'future' rather than the 'past' ”.*

### 7.1.3 Critics

There were few critics of the 'electro-propaganda' in the post war years and perhaps the first were James Carey and John Quirk who examined the notion of electricity as a liberating force in two essays in The American Scholar in 1970. In the first they reviewed the futurist ethos presented by modern intellectuals, such as Marshall McLuhan and Buckminster Fuller, that *“identifies electricity and electrical power, electronics and cybernetics, with a new birth of community, decentralization, ecological balance and social harmony”* (Carey and Quirk 1970: 220). They then identified Harold Innis, the Canadian economist, as the first to produce a systematic critique of the notion that electricity would replace centralization in economics and



politics with decentralization, democracy and a cultural revival. In fact Innis argued the trend of new technologies was towards increased territorial expansion, spatial control, commercialism and imperialism - what we would today call 'globalization'. As Carey and Quirk remarked (1970: 241):

*"He recognized that the speed and distance of electronic communication enlarged the possible scale of social organizations and greatly enhanced the possibilities of centralisation and imperialism in matters of culture and politics".*

Innis argued against technological determinism, and that to achieve a technology's potential requires sympathetic institutions, and a culture that could effectively support alternative styles of life. He thus recommended the maintenance of alternative traditions of life and thought, traditions attuned to the demands of history and the need for stability and continuity (Carey and Quirk 1970: 399). Carey and Quirk concluded that the task of intellectuals was to demythologize the rhetoric of the electrical sublime, and that they should address themselves directly to questions of control of technology: not of centralism versus decentralism but democratization and *"the reconciliation of immense power and wealth with the ideals of liberty and equality"* (Carey and Quirk 1970: 424).

As Winner pointed out the earlier enthusiasts for large-scale electricity projects failed to notice that large dams and power plants would be controlled by electric utilities, firms or government agencies destined to have enormous power (Winner 1986: 95). This issue of the control of technology would be taken up by the anti-nuclear movement, with critics such as Patterson and Lovins, challenging the autocratic decision making of big centralized utilities, like the CEGB. Instead they proposed small decentralized energy sources, based on solar energy, with the thesis that it was decentralization of generation that was crucial to democracy and community not decentralization of use.

#### **7.1.4 Techno-arcadia**

Electrification was promoted in the inter-war years not only as progress for urban areas, but also as the saviour of the countryside, then suffering from a prolonged agricultural depression. This new form of energy it was argued could revitalize agriculture and rural life, and thus preserve the English tradition and way of life. Thus progressives argued that electricity could be the saviour of the traditional way of life! As Luckin remarked (1990: 83):

*"Triumphalists came to stress 'natural' connections between farming, the revival of the 'organic' village community, and the new form of energy as a stimulant to rural crafts and industries".*

This dream of a techno-acadia, longstanding in English and American utopian thought, would allow the decentralization of society and a dynamic, participatory and humanized economy of



villages in which craft would be revolutionized and made more widely available. In this arcadia, the ravages of industrialism and the machine were to be ameliorated in a clean and communal agrarian environment, itself renovated and revitalized by electricity. In return the countryside would learn to love the high voltage electricity pylons straddling the countryside with E.P. Bennett, a Chicago architect, quoted in 1925 as saying there was *"something irresistibly fine in the aspect of great airy structures stalking the hills"* (Levy 1997: 578). Not all could share the modernist's aesthetic tastes but at least they could see them as an essential part of rural life.<sup>94</sup> This dream of techno-archadia was promoted by the ecological planners Patrick Geddes and Lewis Mumford, his American disciple, who saw the potential for decentralized cities through the use of hydroelectricity. Mumford's interest in decentralization and regionalism<sup>95</sup> meant that he, according to the utopian historian Krishan Kumar *"grasped the fact that the flexibility and adaptability of electric communication and electric power... had laid the foundations for a more decentralised urban development in small units, responsive to direct human contact and enjoying both urban and rural advantages"* (Kumar 1987: 485).

Mumford supported the 'village industry' concept of Henry Ford, the car manufacturer, who publicly stated that they could be as efficient and profitable as large scale urban centres (and privately believed that they were less conducive to labour unions and strikes). Ford believed that *"bigger no longer means automatically better, the flexibility of the power unit, the closer adoption of means to ends, and nicer timing of operation, are the new marks of efficient industry"* (quoted in Hughes 1990: 107).

While the countryside welcomed the benefits of electrification in first half of the 20th century there were objections by conservationists based on aesthetic grounds: the damage to the landscape from pylons and dams.

### 7.1.5 Opposition to pylons

The first opposition in Britain was in urban areas where City Councils since the 1890s had opposed the proliferation of local distribution poles and wanted them placed underground. But there was not public opposition until the proposed construction of the National Grid from 1926. Even the 'triumphalists' realized that this plan for 4,000 miles of high voltage pylons crossing rural areas would attract some hostility from those affected by the these 'new and alien physical structures' without yet benefiting from electricity supply. As Luckin remarked *"The natural landscape and 'amenity', farming land and property rights- all would be threatened by the 'march of the pylons' and the building of massive and polluting 'super-stations' "*

(Luckin1990: 94). Conservationists were quick to realize the dangers of the infant National Grid, and the countryside defender, Clough Williams-Ellis, wrote in 1928 *"Clearly the*



*electrification of England will not be accomplished without severe shocks to amenity... What is this magic network going to cost us?"* (quoted in Girling 1996).

However the triumphalists were certain that the long term economic benefits of the National Grid would outweigh the social costs, *"and that the 'community' must be willing to pay high short term costs to achieve so majestic a scientific and cultural transformation"* (Luckin 1990: 95). Rural conservationists were however not convinced and protest groups established themselves in the late 1920s and early 1930s in the South Downs, the Lake District, the New Forest and London. The strong opposition in Sussex led to a two day public inquiry in September 1929 with much national media attention and debate, and lobbying of Ministers. The National Grid plan was however approved, which led to strong feelings of bitterness in rural Sussex at the lack of government attention to local opinion. The approval was seen as an unqualified defeat for the anti-pylon campaign, and led to congratulatory articles in the electrical press at how powerful landowners and articulate intellectuals had been outmaneuvered (Luckin 1990: 100). Subsequently from the early 1930s attitudes to pylons among conservationists and the 'aesthetes' began to change, towards greater acceptance that pylons were part of 'man-made nature.' <sup>96</sup>

#### **7.1.6 Opposition to dams**

Britain had limited hydro-electric capacity, except in Scotland where the first scheme was completed in 1896 by the British Aluminum Company at Foyers near Loch Ness (Luckin 1990: 118). But progress at developing Scotland's hydro potential was slow in the interwar years dogged by conflict over private ownership from Scottish nationalists and its aesthetic and landscape effects from conservationists. It was only with the creation of the North Scotland Hydro-Electric Board in 1943, dedicated to providing social benefits and economic regeneration of the Highlands, that there was substantial dam building.

Worldwide from the 1930 there was great publicity for dam projects with its engineers obtaining a heroic status. As Basalla commented hydro-electricity was *"seen as a perfect, almost magical form of energy"* which would *"lead to the decentralisation of society and to the establishment of a utopian society"* (Basalla 1982: 31). This euphoria reached its peak during the New Deal era in the United States with the TVA intended to serve as a showcase for the positive linkage of electricity, decentralization and citizen participation in reclamation of the landscape. Naturally it failed to live up to its utopian expectations, and to Carey and Quirk it demonstrated the *"folly of identifying technical projects with the creation of democratic community"* (1970: 237).

In the post colonial era in the 1950s leaders of the newly independent nations in Africa saw dam building as symbols of modernity and independence, the most famous case being President



Nasser and the Aswan dam in Egypt. Dams served political purposes, and as John McNeill, the environmental historian, remarked (2000: 157):

*“Communists, democrats, colonialists and anticolonialists all saw some appeal in big dams. Governments like the image they suggested: an energetic, determined state capable of taming rivers for the social good. Dams helped to legitimate governments and popularize leaders, something the United States needed more than ever in the depression year, and something Stalin, Nehru, Nasser, Nkrumah, and others all sought”.*

The TVA was promoted post-war to other countries as a model of dam building for social democracy under the rhetoric rubric of ‘Universal Electrification’, and more discretely as a weapon in the Cold War, an idea later implemented by nuclear power under the ‘Atoms for Peace’ program. However there was increasing opposition post-war by conservationists in the United States and Germany to the building of massive dams that would alter landscapes and adversely effect downstream ecosystems. The building of large dams became a focal point of national environmental protest because they were highly visible and disruptive projects (Rudig and Lowe 1986: 279). In the US, the Sierra Club’s campaign from 1950 to 1955 against the building of a dam at Echo Park, in Dinosaur National Monument, was successful and marked a return by that organization to national campaigning after an absence of over three decades following its damaging and divisive campaign against the Hetch Hetchy dam in the early years of the century.

The Hetch Hetchy dam controversy has assumed mythic status amongst many commentators, a battle lost to the utilitarians but the war won by conservationist to protect national parks. As Neuzil and Kovarik remarked (1996: 125):

*“Hetch Hetchy’s effect on the conservation movement divides scholars and politicians. Many take a lost-the-battle, won-the-war view. On the winning side: No part of a national park has since been appropriated for such a project”.*

The battle was a key mobilization point for conservationists around the country, but the Sierra Club, despite John Muir’s efforts, was split on the issue, which involved for Californians many complex political and social issues over water rights, the public control of utilities, and the role of national parks.<sup>9</sup> Muir, who died in 1914, soon after the battle was lost, was seen by many as a martyr for the conservationist’s cause, and a victory did come with the creation of the National Parks Service in 1916. However the Sierra Club did not fare well, there being a significant minority opposed to Muir’s position- a Sierra Club poll of its members in 1910 voted 589 to 161 for Muir’s position -and eventually about 50 members resigned (Neuzil and Kovarik 1996: 125 n4). As Stewart Udall comments in his memoirs the Sierra Club after the death of Muir



*“became little more than a regional hiking club, preoccupied with the resources in its own backyard”* (Udall 1988: 206). It was only rejuvenated in the 1950s with the appointment of David Brower, as its first executive director, who led, together with the Wilderness Society, a five year campaign to save Dinosaur National Monument (see Gottlieb 1993:41-3).

The significance of the conservationist's victory at Echo Park was well appreciated by one of its leading opponents, Congressman Wayne Aspinall of Colorado when he declared *“If we let them [the conservationists] knock out Echo Park dam, we hand them a tool they'll use for the next hundred years”* (quoted in Brooks 1980: 248). As Paul Brooks commented, the ‘tool’ was nothing less than public awareness that the national parks and monuments had been created for the use and enjoyment of all people, and were thus inviolate (Brooks 1980: 248). By the early 1960s most conservationists supported nuclear power as a preferred alternative to dam building. As John Wills commented (2001: 453):

*“The American conservationist lobby vilified hydroelectric projects as concrete behemoths threatening large-scale disruptions of river ecosystems, while welcoming talk of ecologically benign, self-contained atomic energy facilities. However support for the peaceful atom wavered when atomic developers chose sites of specific interest to the conservation lobby”.*

In the early 1960s the siting of nuclear power plants and their potential impact on scenic resources caused controversy for the Sierra Club.<sup>98</sup> The first site proposed by the Pacific Gas and Electric (PG&E) utility on the Californian coast was at Bodega Bay, which was eventually abandoned as unsuitable after the discovery of the San Andreas Fault beneath it; the site was turned into a nature reserve (Wellock 1998: 17-61; Wills 2001: 465). Some of the Sierra Club's executive then worked closely with PG&E to find an acceptable site, eventually deciding to support PG&E's choice of the Nipomo Dunes. David Brower and others protested the club endorsement of Nipomo Dunes site, questioned its decision making protest and whether the club should participate in such deals. A bitter organizational conflict ensued which almost split the club, led to the firing of Brower and a shake-out of the club's leaders (Wellock 1998: 68-69; Gottlieb 1993: 46; 334: n68).<sup>99</sup> The Nipomo Dunes was abandoned in favour of a site of Diablo Canyon, where a reactor was built.

There was similar opposition in Britain to the use of remote coastal sites for nuclear power stations, particular by Max Nicholson at the Dungeness Inquiry in 1958 (see section 2.2.4). Also the post-war building of hydroelectric plants in Wales did not go unopposed by conservation groups such as the CPRE. The opposition was on amenity and landscape grounds, particularly over developments in Snowdonia National Park.<sup>100</sup> However by 1971 the CEGB, through its



attention to environmental impacts, had much less opposition with its next large pumped storage scheme at Dinorwig (Sheail 1991: 203-6).

## 7.2 The Nuclear Age

The atomic utopia began, according to Basalla (1982: 33-5), with the promotion of atomic energy by Frederick Soddy in his 1909 book *The Interpretation of Radium*. Soddy was a leading nuclear physicist as well as popular author and public lecturer, and Basalla believed he began the process of mythicizing atomic energy as an inexhaustible supply of power, which could be used to transform society, and heralding the possibility of an atomic utopia. But as Brian Easlea, a historian of science, points out Soddy also gave us the image of atomic dystopia, with Soddy warning us that a single mistake might not mean the smiling Garden of Eden but extremely disastrous consequences for mankind, perhaps a return to conditions of the Stone Age or even worse (Easlea 1983: 50).

Soddy's views on atomic energy had a great impact on the public, and inspired H.G. Wells to write his famous science fiction novel *The World Set Free*, (subtitled *A Story of Mankind*) published in 1914. Wells explicitly dedicated his book to Soddy's *The Interpretation of Radium*, and gave the world the first vision of what he called the 'atomic bomb'. As Basalla remarked Soddy's scientific work and his prophetic statements were seized upon by H.G. Wells, who then "*explored the pessimistic strain in Soddy's thought by writing a novel, The World Set Free (1914), in which the atom was first used in a devastating world war*" (Basalla 1982: 33). This world war is dated for 1956 and presents a very bleak picture of the horrors of atomic warfare with hundreds of cities destroyed. Later in the book the atom is used for peaceful purposes and it concludes with a cultural renaissance spawned by atomic power. This novel was highly influential in giving us conflicting images of atomic power, which were utilized by future science fiction writers. As Basalla concluded "*The World Set Free might well stand as a symbol of the ambiguous response of Western men and women to atomic power. The choice was utopia or oblivion, The Garden of Eden or Armageddo*" (Basalla 1982: 33).

While other authors do not dispute the impact of Soddy's 1909 book and Wells' 1914 novel, they see the roots of nuclear euphoria (and ambiguity) dating back further to the discovery of X-rays and radium at the end of the 19th century. The discovery of the phenomenon of radioactivity in 1896 due to X-ray emissions from radium, led to a 'radium craze' amongst the public beginning in 1903 (Badash 1979). Radioactivity was seen as scientific miracle with a wide range of positive health effects. Newspaper coverage in the early 20th Century was strongly positive, even though it was acknowledged that exposure to radium causes burns and eventual death. Scientists who died were considered as 'martyrs to science', and the press, scientists and



industry all promoted the view that the benefits of radium, particularly for ‘curing’ cancer, strongly outweighed any hazards.<sup>101</sup> This aggressive support for radium and popular interest in all atomic discoveries must be seen in the context of the strong support for science and technology, which in the 1930s led to the utopian ideology of ‘scientism’, an unshakeable belief in the virtues of the scientific method. Similarly Stephen Hilgartner and his colleagues believed that the excessive belief in and promotion of atomic energy led to ‘nukespeak’, which they describe as the language of the nuclear mindset - the world view or system of beliefs of nuclear developers. They wrote (Hilgartner et al 1983: xiii):

*“euphoric visions of nuclear technologies are an important expression of the nuclear mindset. The discovery of X-rays and radium at the end of the 19th Century brought forward visions of a technological Garden of Eden. The philosopher’s stone and the elixir of life had been found at last”.*

The discovery of nuclear fission produced by U-235 in 1938 unleashed a torrent of similar imagery: nuclear-powered planes and automobiles would whisk us effortlessly around the globe, while unlimited nuclear electricity powered underground cities, farms, and factories (see illustrations in Langer 1940; also in Popular Mechanics, January 1941, p3). While the destructive possibilities of atomic energy were acknowledged, these were swept away by the argument that U-235 was too valuable to waste as an explosive and *“Industrious, powerful nations and clever, aggressive races can win at peace far more than could ever be won at war”* (Langer 1940: 18). Langer’s article in 1940 in the popular US magazine Colliers is an example, perhaps extreme, of the then utopian projections of the technical and social transformations that U-235 would have on society. While his technologies of nuclear-powered planes soaring to 50 miles above the surface of the earth and off-road automobiles roaming the planet were the stock of 1930s sci-fi fantasies, his social predictions of the end of poverty, class and war were the product of pre-war scientism and faith in social engineering, inspired by admiration for the Soviet Union and satirized in novels like *Brave New World*. Langer boldly declared that we are entering (1940: 18):

*“...a period of unparalleled richness and opportunities for all. Privilege and class distinction and other sources of social uneasiness and bitterness will become relics because things that make up the good life will be so abundant and inexpensive. War itself will become obsolete because of the disappearance of these economic stresses that immemorally have caused it”.*

The main problems seen in this future are boredom caused by excessive consumption, uniformity of living standards and lack of novelty. While there may be ‘eccentrics and



criminals' who might want to use U-235 for 'destructive purposes', this problem Langer believed can be overcome by ensuring "*that the citizens of the future be educated better than they are now with respect to their social responsibilities*". If this is not sufficient then eugenics can be used, with Langer warning that "*Certain kinds of abnormalities will have to be overcome or their possessors destroyed*" (Langer 1940: 54). Finally Langer proposes a system of 'proliferation' control saying that "*society will have to keep track of all the Uranium produced and refined, and take action at once against any individual who tries to accumulate a dangerous supply*" (Langer 1940: 54).

Despite its utopian predictions and upbeat message Langer's article unwittingly re-emphasizes Soddy's warning three decades earlier, about the possibilities of nuclear destruction if sufficient care is not taken. How to exercise this care was to occupy the minds of the more thoughtful nuclear advocates for the next three decades, culminating in Alvin Weinberg's proposal for an 'nuclear priesthood' to watch over us for generations to come (Weinberg 1972).<sup>102</sup>

### 7.2.1 The atomic bomb: Doomsday or paradise

After the dropping of the two atomic bombs on Japan in 1945 there was a rush by publishers to produce books on the new atomic age. The first was *The Atomic Age Opens* by Donald Geddes, a 256 page paperback compendium of news stories, editorials and pronouncements by world leaders, which along with other books, such as *Atomic Energy in the Coming Era* by David Dietz, gave detailed description of the coming atomic utopia.

The atomic bomb caused intense public debate in the United States on the morality of using atomic weapons, and fear and anxiety about the consequences of atomic warfare (Boyer 1985). The public were presented with two conflicting visions of the atomic future, and journalists gave their readers the image of society being at a nuclear crossroads. However this public anxiety faded in a year or two to be largely replaced with a post war nuclear euphoria. David Lilienthal<sup>103</sup>, the first Chairman of the Atomic Energy Commission created in 1946, helped popularize this optimism writing in The Nation in 1946 of "*the almost limitless beneficial applications of atomic energy*" (Lilienthal 1946: 41) while in the mass circulation magazine Newsweek they wrote about the "*miraculous powers of atomic-fission energy*" (Ford 1982: 29). William Laurence, a well known writer for the New York Times was an enthusiastic promoter of what Hilgartner calls the 'the sunny side of the atom'. In an article in 1948 for the mass circulation Woman's Home Companion entitled 'Paradise or Doomsday'. Laurence wrote in utopian tones, saying that humanity, had with his knowledge of how to harness the enormous power of the atom for good or for evil, had been "*given a chance to enter a New Eden*" and that atomic energy gave man a most powerful tool for "*abolishing disease and poverty, anxiety*



*and fear*” (Laurence 1948: 33). Furthermore Laurence, enthused, provided man managed to avert the disaster that could transform him and all his works into ‘a cloud of dust’, he had in atomic energy ‘a very philosophers stone’ with which he could “*remold the world nearer to his heart’s desire*” (Laurence 1948: 75). As Hilgartner comments nuclear advocates after 1945 promoted the ‘sunny side of the atom’ downplaying economic and proliferation problems (Hilgartner et al 1983: xiv):

*“Once atomic energy was applied for peaceful purposes, a nuclear powered paradise would be at hand. Electricity ‘too cheap to meter’ would power the new Golden Age. No problem would be too difficult to solve quickly and economically. Reactors would operate safely the disposal of radioactive waste would be a nonproblem; international safeguards would allow the benefits of the peaceful atom to spread to every nation while preventing the spread of nuclear bomb”.*

However as the coming atomic utopia failed to be realized by the early 1950s there was increasing public scepticism despite an optimistic facade from its chief promoter the AEC. In private many scientists were pessimistic. In a report dated July 1947 to the AEC Robert Oppenheimer, the creator of the atomic bomb and post war ‘atomic hero’, wrote “*it does not appear hopeful to use natural uranium directly as an adequate source of fuel for atomic power*” (Ford 1982: 33). Thus by the early 1950s, no AEC statement could conceal the basic fact that the era of atomic power was not arriving quickly, because of the reluctance of utilities to invest in a completely untried technology.

As Daniel Ford remarked the “*euphoria of the early post war years gave way to gloom about the prospects of an atomic future*” and leading magazines like Newsweek wrote at the end of 1950, “*As yet no deserts have burst into bloom, no polar icecaps have melted away. The brave new world of cheap and abundant atomic power seems more remote than it did just after the war*” (Ford 1982: 36).

### **7.2.2 Atoms for Peace**

In the early 1950s the dream of atomic energy had stalled, despite popular enthusiasm. Some economists openly expressed doubts as to its economic feasibility and practicality, and there was little immediate prospect and much disagreement on any likely timetable for the construction of a commercial nuclear power station. What revitalized the atomic dream and launched a commercial program was the ‘Atoms for Peace’ speech by President Eisenhower on 8 December 1953 at the UN. It marked a major shift in government atomic policy ending the government monopoly on nuclear power, and rekindled the idea of a nuclear utopia. He urged that nuclear materials be used for peaceful purposes and to “*provide abundant electrical energy*



*in the power-starved areas of the world” and stated that “The United States knows that peaceful power from atomic energy is no dream of the future. That capability, already proved, is here-now- today” (Ford 1982: 40).*

Once again the atomic visionaries rushed into print repeating the old 1940 predictions with a few new ones. There would be nuclear powered planes, trains, ships, and rockets; nuclear energy would genetically alter crops and preserve grains and fish; and nuclear reactors would generate very cheap electricity. New was the idea of using nuclear explosive to alter the landscape - a scheme to achieve notoriety as ‘Project Ploughshare’.

The most famous phrase of the this era, and one that was to haunt the nuclear industry forever more, was uttered by Lewis Strauss, a former Wall Street investment banker, and the new chairman of the AEC in his speech to the National Association of Science Writers on 16 September 1954. Strauss set out the themes that the AEC wanted the media to present to the public. Electric power from the atom, he said, could be available, according to the AEC's experts, in *“from five to fifteen years, depending on the vigour of the development effort”*. He then went on to give his vision of the atomic utopia saying *“It is not too much to expect that our children will enjoy in their homes electrical energy too cheap to meter, will know of great periodic regional famines in the world only as matters of history, will travel effortlessly over the seas and under them and through the air with a minimum of danger and at great speeds, and will experience a life span far longer than ours... This is the forecast for an age of peace”* (quoted in Ford 1982: 49-50).

The phrase ‘too cheap to meter’ has become the cliché of the nuclear age and the stick with which the anti-nuclear campaigners from 1970 continually reminded the public about the failed promises of the nuclear promoters.<sup>104</sup> However Strauss was only repeating the dream of atomic promoters since 1940, when Rudolph Langer first said that in the forthcoming atomic age *“Energy has become so cheap that it isn’t worth making a charge for it”* (Langer 1940: 19).

While the year before Strauss’ speech, Ralph Lapp<sup>105</sup> in his book *The New Force* had repeated an earlier prediction by Robert Hutchins that *“heat, light and power... will be so cheap that their cost can hardly be reckoned”* (Quoted in Ford 1982: 30).

In his speech Lewis Strauss invited his audience of science writers to ‘work together’ with the AEC and its scientists to educate the public about the atom and its promise.<sup>106</sup> As Daniel Ford commented (1982: 50):

*“From the laudatory articles on nuclear energy that appeared over the next two decades- and the rarity of any critical coverage of the potential hazards- it is evident that the national media responded to the Chairman’s invitation as he had intended”.*



Thus with unquestioning support from the media, and unqualified endorsement by Congress and the Administration, the advocates of a large nuclear power program proceeded, unchallenged, with their ambitious enterprise. They were aided by the stream of euphoric books, with titles such as *Our Friend the Atom* by Heinz Haber and *The Fabulous Future* edited by *Fortune* magazine. There were even films, such as *The Genie and the Bottle*, a 1956 book turned into a Walt Disney film (Hilgartner 1982: 33).

The book *The Fabulous Future* is subtitled 'America in 1980' and has a series of essays on what life in America should be like written by leading figures in US political and social life, including Earl Warren, Adlai Stevenson and John von Neumann, then a board member of the AEC. Unlike his fellow contributor, the industrialist David Sarnoff, who stated that "*it can be taken for granted that before 1980- ships, aircraft, locomotives and even automobiles will be atomically fueled*" (Sarnoff 1956: 17), von Neumann is less optimistic about atomic technology seeing its destructive side. In his essay, *Can we Survive Technology*, he only gives a page out of his 15 pages to nuclear power, saying that the future lay not with steam generating fission reactors but with exploitation of 'still more abundant modes' (an oblique reference to the fast breeder<sup>107</sup> or the possibilities of fusion energy). Given steady development he believed that "*in a few decades hence energy may be free -just like unmetered air*" (Neumann 1956: 37).

In this technologically optimistic era there were few people who publicly raised the question of the harmful consequences of the peaceful uses of atomic energy, such as radiation hazards and waste disposal. These adverse consequences were known to scientists right from the beginning of atomic energy, as they were during the early years of the 20th century during the era of the 'radium craze'. As early as May 1940 a report for the National Academy of Sciences talked of 'Radioactive poisons' as products of atomic fission (Basalla 1982: 34). As Basalla commented (1982: 34):

*"In all this euphoria there were few who discussed radioactive wastes, the dangers of radiation, or the possibility of a dangerous accident at a nuclear generating plant. All these issues had been raised publicly by scientists, but layman and nuclear expert alike were all caught in the grips of a myth that portrayed atomic energy as perfect, inexhaustible, and utopian in its social implication".*

### **7.2.3 Nuclear Power comes on line**

After Eisenhower's 'Atoms for Peace' speech in December 1953 there was rapid commercial development of nuclear power. Construction started on the first reactor in September 1954 at Shippingport and on 18th July 1955 the reactor came on line. Following this success the Atoms for Peace rhetoric continued with the issue in July 1955 of an Atoms for Peace stamp (see



Hilgartner 1982: 48 for illustrations of it), and in August 1955, the first UN Conference on the Peaceful Uses of Atomic Energy, in Geneva. The pace of commercial nuclear power development quickened from December 1963 when General Electric offered a fixed price (turnkey) contract to building the Oyster Creek power station. By the end of 1966 another eleven turnkey contracts were signed together with 16 other contracts (Cohn 1997: 46). The rapid expansion of nuclear power in the US in the 1960s was, according to Steven Cohn, partly due to the public's buoyant faith in business and public leaders and their faith in the ability of science and technology to unambiguously solve social and economic problems (1997: 18). Even those who expressed criticism of American society and its political structures saw nuclear power as a liberating influence. For instance in 1962 the founding document, *The Port Huron Statement*, of the Students for a Democratic Society (SDS) declared "*Our monster cities, based historically on the need for mass labor, might now be humanized, broken into smaller communities, powered by nuclear energy*" (Miller 1987: 364). By the mid 1960s with a large nuclear programme underway the dream of atomic energy and an all electric future seemed imminent. A 1967 Westinghouse pamphlet entitled *Infinite Energy* declared that nuclear fission "*will gives us all the power we need and more. That's what it's all about. Power seemingly without end. Power to do everything man is destined to do.....the hope and exuberance of boundless energy. We have found what might be called perpetual youth*" (Quoted in Hilgartner et al 1982: 190). The illustration in this pamphlet of the future gave a vision of the all-electric future, a world very similar to that drawn in Langer's article in 1940, of homes with movable roofs, indoor farming, and computer operated agricultural machines.

Nuclear researchers such as James Lane<sup>108</sup>, pointed to graphs showing falling nuclear costs and the continued historic decline in electricity prices, and using trend projection exclaimed boldly in August 1968 that the "*over-all result may lead to fulfillment of the age old dream of electricity too cheap to meter*" (Quoted in Hilgartner et al 1982: 189). As the US anti-nuclear movement gathered pace in the late 1960s and early 1970s, the nuclear vision remained unabated by its advocates. In 1971 Glenn Seaborg, the head of the AEC from 1961-71, and William Corliss published their book *Man and the Atom* subtitled *Building a New World through Nuclear Technology*. In predictions for 2000 they forecast that "*nuclear power would be a phenomenal success bringing unimagined benefits for the greater part of humanity*" (Smil 1993: 152). While Daniel Ford described the book as a "*a visionary dream of atomic-powered plenty*" with atomic energy as "*a magician's potion that would free industrial society permanently from all practical bounds*" (1982: 23). Seaborg believed that the future of civilization was in the hands of the nuclear scientists who formed the elite team that would



*“build a new world through nuclear technology”* (quoted in Ford 1982: 23). The nuclear dream was still the same as three decades ago with Ford commenting on Seaborg’s vision (Ford 1982: 23):

*“The deserts could be made to bloom, sea water could be made potable, mountains could be moved, rivers diverted- all as a result, he prophesied of ‘planetary engineering’ made possible by the miraculous new element that he had discovered. There could be vast farming and manufacturing centres, or ‘agro-industrial complexes’, built around giant nuclear electric-generating stations- each nuclear power plant surrounded by its own little Eden”.*

Seaborg was an enthusiastic promoter of the use of nuclear bombs to reshape the landscape and alter nature, a scheme that had official US government backing in the form of Project Ploughshare. Seaborg wrote *“All of humanity’s efforts to restore the Garden of Eden have been futile so far. Man’s machines have not been powerful enough to compete with the forces of nature”* (Quoted in Hilgartner et al 1982: 50).

#### **7.2.4 Nuclear euphoria in Britain**

In Britain the 1955 White Paper (HMSO 1955), on the first nuclear power programme, was greeted with acclaim by the press, which followed it up with glowing reports on the triumphal opening of Calder Hall by the Queen in October 1956 (see Welsh 2000: 56-8). After the Suez Crisis in 1956, the Government took the opportunity to triple the expansion of the nuclear industry with nearly all the establishment and the media seeing nuclear power as part of *“the white heat of an oil-free technology that would bring Britain into a new age of prosperity”* (O’Riordan 1986: 42).

However there were critics of this hasty policy of nuclear expansion using an unproven reactor system, the Magnox. The Times commented *“Atomic energy has the power to evoke fantasies. It is not only looked on as an ‘answer to Suez’ but as a fairy godmother source of cheap electricity”* (Times 1957). It further cautioned against prophets who visualize that in twenty years time there will be *“electricity on tap in every home like water, laid on for a low fixed charge irrespective of the quantities consumed”*.

The Times unswayed by the myth of cheap atomic energy warned that *“The hard fact is that electricity from the first atomic power stations will be dearer, not cheaper, to generate than power made in new coal-based stations”* (Times 1957).

One internal critic, who went public, was Kenneth Stretch (see section 2.1.1) who questioned both the cost forecasts for nuclear electricity and the wisdom of so large a commitment to one reactor system (Stretch 1958). However as Welsh remarks *“Such concerns could scarcely be*



*heard within the overall climate of adulation*" (Welsh 2000: 64). Even internal critics like Hinton who viewed the trebling of the programme as 'complete madness' refused to support Stretch and only publicly acknowledged the truth of Stretch's critique in 1975 (Welsh 2000: 64).<sup>109</sup>

There was further nuclear euphoria in May 1965 with the decision to choose the AGR, rather than the LWR, for Dungeness. This bought rave reviews for the nuclear industry with Williams writing "*Echoing 1955 the British press gave the AGR's success an enthusiastic, and mostly uncritical, reception. The stock words were used: 'triumph', 'breakthrough', 'decisive advantage'*" (Williams 1980: 145). Criticism of the AGR by Duncan Burn (1967) was brushed aside by euphoric politicians, including Tony Benn.

The claims for the utopian benefits of nuclear power were heard during the debate over the proposed Stourport reactor in 1970. Its chief supporter Cllr. Stanley Jones, the chairman of local planning committee was quoted, in a front page story in the local newspaper under the headline 'Stourport a 'Boom' Town', as saying "*everyone will get very prosperous from the £100 m station*", as several thousand workers would be employed, (KS 23 January 1970: 1). However the following week a rival paper the KT&SN (30 January 1970: 12) commented on his claims by saying "*...many people will need more convincing proof that the erection of the £100,000,000 plus nuclear station will indeed bring greater benefits to the majority of the inhabitants*".

In response to such criticism of the nuclear station Jones used, in an article entitled 'Nuclear Power will bring better life for Millions', the standard pro-nuclear arguments of the need for more electricity due to economic growth and the threat of power shortages if the station was not built (KS 20 February 1970: 11). However his 'boomtown' claims were dismissed by a fellow councillor A. Hall who said that this "*cannot be substantiated by the facts*" and in fact fewer people would be employed in the new nuclear station than at the current coal-fired station (KS 20 March 1970).

The tendency of local officials to be blinded by the supposed benefits of nuclear power was also evident at the Portskewett Inquiry in 1971 where it was reported that the public of Portskewett had 'lost all confidence' in their elected county officials because of "*their excessive enthusiasm... in projecting the merits of nuclear power*" and their 'subservience' to the CEB (DTI 1971b:32). By then there was no longer confidence in government experts and there was a new found willingness to listen to dissenting scientists like Sternglass, Gofman and Tamplin. As one local objector said "*Atomic energy was a field which had far too many experts in it. One wonders which expert was right and which was wrong*" (DTI 1971b: 45).



### 7.2.5 The end of the nuclear dream

By the early 1970s disillusionment had once again set in with the nuclear dream, as it had in the late 1940s, as it failed to deliver. This time the factors that had supported its rejuvenation in the mid 1950s were under attack, namely public trust in business and government leaders and faith in the ability of science and technology to solve social and economic problems. The problems with nuclear power, were as always still with it, but now the public no longer had faith in the ability of government, business and science to solve them. Since the early years of the 20th century there had always been ambivalence amongst the public about the benefits of atomic energy and leadership by technocrats, and these cultural countercurrents, submerged during the post war era, resurfaced in late 1960s. As Steven Cohn commented *"Cultural ambivalence towards nuclear energy quietly persisted, however, emerging publicly in the late 1960s and early 1970s when a different social context permitted bundles of cultural beliefs to reach critical mass and capture social influence"* (Cohn 1997: 20).

The nuclear advocates claimed that their critics were unduly pessimistic, and were acting as prophets of doom. As early as 1955 Fred Cottrell, discussing speculation on the impact of atomic power, wrote *"The prophets of doom say it will condemn man to a return to the cave"* but more optimistically *"there are those who see in atomic energy the basis for a brave new world, in which war is impossible and men are freed from the necessity to work"* (Cottrell 1955: 1). He saw the introduction of new energy sources always giving rise to this speculation of doom or utopia, and concluded *"man has only abandoned one source of energy for another because of the prospect of overwhelming advantage, and then with reluctance"* (1955: 1). So what of the dreams of the atomic age bringing unimagined benefits for most of the humanity? Vaclav Smil concluded *"none of this has come to pass, and the retreat of nuclear generation has almost been certainly the costliest technical miscalculation of the 20th Century"* (1993: 152). Hilgartner and his colleagues lay the blame for the failure of nuclear power on the 'nuclear mindset' of its promoters arguing that (Hilgartner et al 1982: xiv):

*"Time and time again, nuclear developers have confused their hopes with reality, publicly presented their expectations and assumptions as facts, covered up damaging information, harassed and fired scientists who disagreed with established policy, refused to recognize the existence of problems, called their critics mentally ill, generated false or misleading statistics to bolster their assertions, failed to learn from their mistakes, and claimed that there was no choice but to follow their policies".*

A more measured response is from Steven Cohn who sees the tragedy behind an idealistic venture, and he ends his book with the words (1997: 318):



*“The sad conclusion from my perspective is that the nuclear dream has not worked out. The technology has failed and should be put aside until other energy options have been exhausted and the industrial subculture that nurtured the first nuclear era dismantled. I find this a sad conclusion because the nuclear dream was compelling, the imaginations behind it were talented, and the human energy and economic wealth mobilized to pursue it were enormous”.*

### 7.3 Solar energy: a long standing dream

The belief in the possibility of a utopia powered by solar energy is long standing, dating back to the Renaissance if not beyond.<sup>110</sup> This belief faded in the early 20th century, as the appeal of hydro and nuclear power asserted themselves, but was reborn in the late 20th century as these two energy sources fell from favour. Solar energy, renamed ‘natural’, ‘renewable’ or even ‘sustainable’ energy, is now seen as an essential part of the move to a ‘sustainable’ society which while not a utopian one still possesses much ecological and social virtue (Scheer 2002). Solar energy is used in its widest sense, encompassing energy not only directly from the sun but also indirectly from wind, waves, the tides, and water (but not from large dams), and from biomass sources (such as from trees or agricultural residues).<sup>111</sup> That is energy from sources which are not depletable, hence the term ‘renewable’ or ‘sustainable’ (Boyle 1996). Basalla points out that the sun and its life giving powers has long standing religious and mystical associations dating back millennia. He remarked *“there exists an ancient and pervasive solar mythology which has influenced all subsequent responses to the sun. No other form of energy has come to us with the rich symbolic overtones associated with the sun”* (Basalla 1982: 36).

#### 7.3.1 19th Century Solar Utopias

Given that until the Industrial Revolution, and the widespread use of coal, there was no life, heat or power without the sun, it is entirely understandable that old utopias were centred around the sun, and that the ancient myths and symbolism of the sun as the source of life, wealth and health should persist until today. Intimately associated with solar energy is the idea of small communities, generally agricultural and decentralized, living in ‘harmony with nature’, and this was a staple of utopian fiction in the 19th century.

One utopian work that gave detailed consideration to using solar energy was by John Aldolphus Etzler, a German living in Pittsburgh. In his 1833 work entitled *A Paradise Within the Reach of All Men, Without Labour, by Powers of Nature and Machinery*, Etzler proposed the creation of a paradise based on material luxury within ten years simply by harnessing the planet's cost-free energy sources - the wind, the waves, the tides and the sun. His pamphlet contains detailed



mathematical calculations of the power that would accrue and simple descriptions of the machines needed to access and store it. His belief was that “*Nature affords infinite powers and wealth*”, and its exploitation should be the basis for a more perfect society (Greenberg 1990: 693). However as John Carey, a chronicler of utopias, comments (Carey 1999: 229):

*“Unlike modern advocates of natural energy, Etzler was not concerned to preserve the environment. Very much the contrary: he wanted to change it entirely. Mountains will be flattened, rivers will flow in vitrified channels, deserts will flower”.*

The natural world would be completely remoulded to man’s taste. Etzler proposed that America’s large forests be ‘ground to dust’ and then ‘cemented by liquor’, to provide a ‘universal building material’, rather like plastic wood. This would then be moulded by machinery to any shape and, if required vitrified, so that it will be virtually indestructible and will ‘radiate with a crystal-like brilliancy’. Mankind will live in an immense sculpture park, the greenery tastefully interspersed with porticoes, foundations and statues, all dazzling to look at. Dolores Greenberg, an American historian, believed that Etzler’s treatise had a big influence on later 19th century utopian thought, particularly on Robert Owen, especially Etzler’s idea of “*abundance without labour, the product of harnessing the energy of the sun, the tides, the water and the wind*” (Greenberg 1990: 693). However Etzler’s idea of utopia as luxurious living did not appeal to all, especially Henry Thoreau. He read it with ‘deep disfavour’ and in an 1843 review deplored its emphasis on “*gross comfort and pleasure at the expense of the higher life*” (Carey 1999: 230). According to Carey it seems to have set Thoreau thinking, and little more than a year later he built his wooden hut on the edge of Walden Pond and began his two year retreat from materialism and the pressures of civilization, described in his classic *Walden, or Life in the Woods* (1854).

By the late 19th and early 20th century, due to technical advances and mass production, renewable energy devices had become widespread, particularly windmills for water pumping in the North American plains, solar water heaters in California and Florida, and solar power plants to produce steam (Butti and Perlin 1980). There was also electricity production from hydro and geothermal power. The ‘Back to the Land’ movement in Britain in the late 19th century praised the virtues of small communities and the preservation of nature, and saw electricity from hydropower as allowing an escape from cities to the countryside (Gould 1988: 81). The outlook for solar energy looked bright, and writers choose it for their rural utopias, contrasting it to the evils of urban societies based on coal. William Morris, in his famous utopia, *News from Nowhere* (1890), has society powered by electricity generated from wind and water power, while Jules Verne in his 1890s short story, *In the 29th Century*, uses wind, water, solar and geothermal



energy, and H.G.Wells has wind and water power (monopolized by Windvane and Waterfall Trust) in *When the Sleeper Awakes* (1899). While in the 1903 book, *The Case of The Fox*, William Stanley had his utopia powered by a multitude of renewable sources of energy.<sup>112</sup> However after the First World War interest in solar power quickly declined due to the discovery of new sources of oil in Iraq and Iran. There was soon a world oil and gas glut, and solar energy disappeared from the public view until after the second World War.

### 7.3.2 Solar v atomic energy

After the second World War there were fuel shortages and rationing in the US and Britain, particularly for domestic consumers. There was a great debate about energy for the future, with warnings on oil running out, the possibility of cheap atomic power and the promise of solar energy. This debate was also set against public concern, raised by conservationists such as William Vogt (1948) and Fairfield Osborn (1948) about the dangers of world population growth and limits to food and natural resources. Thus the warnings in 1949 by King Hubbert, an oil geologist, on future fossil fuel shortages attracted much attention and Palmer Putnam, was commissioned in 1949 by the AEC to write a report on long term (50 years) energy prospects. Putnam, whose book *Power from the Wind* (1948) had been published the previous year, had much personal support for solar and wind power, but in his report he judged solar energy as too expensive, and the future energy solution he believed was with the development of nuclear power and the electrification of economy.<sup>113</sup> This view was opposed by Farrington Daniel, who was a keen advocate of solar energy and a leading contributor to the debate about the merits of atomic and solar energy (Daniels 1949; 1950; Daniels et al 1949).<sup>114</sup> Daniels and his colleagues agreed with the conservationists writing that “*humanity is on an unrepeatably spending spree, that we are using up minerals and energy resources on an unprecedented scale, and that these will run out in the foreseeable future*” (1949: 19).

However the solar dream faded with the easing of post-war fuel shortages. New oil and gas resources were developed, and the US government committed itself to nuclear power. Nevertheless solar advocates persisted, forming the Association for Applied Solar Energy in 1955, followed up by a World Symposium in Phoenix, Arizona in 1956. Until 1973 this was to be a era of cheap oil, but despite this there was a continuous stream of books promoting solar energy, such as from D.S. Halacy (1957; 1963), Franklyn Branley (1959), Farrington Daniels (1964) and Brian Brinkworth (1972). Solar energy did not however disappear from policy view, but it was just considered as a ‘backstop’ or ‘insurance’ energy source in case of fossil fuel shortages or the failure of nuclear power. Typical of this viewpoint is Dennis Gabor who writing in 1963 said (Gabor 1964: 83):



*"There is no need, however, to base our hope for abundant energy supplies on fusion power only. We have seen that the free and inexhaustible sources of power - wind, water, tides, geothermal and solar energy - are either too small or too unprofitable at the present time. But they could be large enough for a reasonable humanity which prefers civilization to numbers, nor will they be unprofitable at a time when oil is no longer there to gush out of the earth. Civilization need never be in danger for lack of power".*

### 7.3.3 Solar as Hip

The revival of interest in solar energy (as a utopian energy source) amongst the public was started by the counterculture in the late 1960s in the US. One of the first examples was at Drop City, a drop out artist community in Colorado, where inspired by the hi-tech utopian writings of Buckminster Fuller, they built domes and a solar water heater (Rybczynski 1980: 90). This idea of using free energy and DIY technology received wide publicity, and solar energy received extensive mention in Stewart Brand's seminal publication *The Whole Earth Catalog*, first published in 1968. Brand set out to create a survival manual, and extolled alternative energy and the virtues of disconnecting yourself from the grid. In the *Catalog* Steve Baer <sup>115</sup> reviewed Farrington Daniels' book, *Direct Use of the Sun's Energy* and said that it was (Brand 1968: 28):

*"The best book on Solar Energy that I know of... Any curious and intelligent person can learn a great deal about our planet and ourselves by reading this book about ways of using sunlight... I read the book on a Greyhound bus in Texas two years ago and it has changed my life and my way of thinking".*

Solar energy was now not just for physicists but could be used by anyone with simple technical skills seeking energy independence. Technology, not rioting on the streets, was now the key to 'revolution' in society. As Langdon Winner commented the obsession with technology arose about the same time - from 1969 - as a general disillusionment with protest politics which had become too dangerous or depressing. He wrote (Winner 1986: 65):

*"It was during this period that many in the US dropped out of political activity and began a certain kind of sociotechnical tinkering: roof gardens, solar collectors, and windmills became a focus of community action".*

About this time came the belief that what was needed was a new type of technology, one that if used morally and ecologically could create a utopian society. This technology went by a wide variety of names, the earliest was 'Intermediate Technology' coined by Fritz Schumacher in 1964 (Schumacher 1966). For the next ten years a group of countercultural radicals, environmentalists, scientists and social activists discussed the concept and invented names like Appropriate, Alternative or Radical Technology, often shorted to 'AT'. There were numerous



definitions of AT, each with long lists of attributes, but basically all agreed that AT had to be 'cheap, simple and ecologically safe' (Kirk 2002: 362). Above all it had to use solar energy. There was an immense amount written on AT in the 1970s mostly by enthusiasts<sup>116</sup>, with recollection by two participants, Witold Rybczynski and Langdon Winner appearing in 1980. AT merged into the 'soft energy' movement based on energy efficiency and renewable energy, popularized by Amory Lovins (1977). This initially had a strong belief, like AT, that the choice of energy technology could radically alter society, but its utopian sentiments had to be toned down in the 1980s in order to succeed under the 'free market' ideology of the Reagan and Thatcher governments.

Since then utopian sentiments have been strongly suspect, but solar energy now respectable as renewable energy is still being promoted as the solution to many of society's problems. In one of the few retrospective analyses of AT Andrew Kirk remarked that the AT movement's thoughtful reevaluation of the role of technology in society "*is perhaps the most significant and lasting contribution of the counterculture to American culture*" (Kirk 2002: 355). Despite the high hopes of solar enthusiasts in the 21st century, couched in the new utopian language of global sustainability, Basalla's words of warning on believing in energy utopias from 1982 may still be relevant. Solar energy myths he warned "*have been exposed as naive and unrealistically optimistic. The energy of the sun will be utilized, but it will not be done soon; it will be more costly than we can imagine; it will not be without environmental problems; and it will not form the basis for a new utopian way of life*" (Basalla 1982: 38).

## **8. Conclusion**

The year 2003 is an ironic time to examine the myths of the nuclear age. Fifty years ago (on 8 December 1953) President Eisenhower gave his Atoms for Peace speech which launched the nuclear age, to be the 'dream of the future'. However fifty years later we instead see the collapse, perhaps bankruptcy, of British Energy, the UK's main nuclear generator. Furthermore underlining this fall from grace is the stated refusal of the current Labour government, in its latest White Paper on Energy, to support the construction of any more nuclear power stations (DTI 2003). British Energy's demise is due partly to technical problems with old plant, but mainly due to financial problems caused by NETA, the new electricity trading arrangements, whereby the electricity wholesale price has been forced below the cost of nuclear generated electricity. Thus we are witnessing the end of one of the most famous myths of the nuclear age that has lasted for nearly 50 years, that electricity from nuclear power stations would become 'too cheap to meter'.

This Chapter pulls together the arguments and analyses made in this thesis, in particular arguing that existing accounts have been inadequate in some respects. It makes the following general points about the anti-nuclear movement and how it has been portrayed by observers:

1. There were very mixed motives for the opposition to nuclear power, not all 'environmental'.
2. There were two distinct yet related national campaigns against nuclear power in Britain, the first in the mid 1960s, the second in the mid 1970s.
3. The origins of opposition to nuclear power are complex, but are best summarized as 'nuclear fear'.
4. There has been a tendency in the histories to concentrate on the role of FoE, and ignore other anti-nuclear groups and activists.
5. The role of women activists has been neglected, due to an emphasis on technical and policy debate.

Finally it poses the question of whether the current promotion of solar (and renewable) energy has the characteristics of 'energy utopianism', and if so is this likely to be successful at creating a sustainable future? Or will the opposition to its prescriptions (such as windfarms) emerge as it did to nuclear utopianism?

### **8.1 Reasons for opposition**



What exactly were the campaigners against nuclear power opposed to? Their motives were diverse, ranging from NIMBY concerns through to opposition to capitalism. Motives for opposition to nuclear power can be divided into four categories:

1. NIMBY - opposition to any large scale development that threatens the status quo.
2. Vested interest - opposition by the coal miners fearful of their jobs.
3. Intellectual - based on aesthetic, ecological, ethical and economic reasons.
4. Opportunistic - an opportunity by political groups to attack government policies.

### 8.1.1 NIMBY concern

NIMBY (Not in My Backyard) opposition is easy to understand and identify, and forms the bedrock of local opposition to proposals for nuclear plants. In its early days it was termed the 'amenity issues' lobby, that is people opposed to developments in unspoilt countryside. Partly this was out of aesthetic concern by urban intellectuals for preservation of outstanding scenery, and partly due to the rural aristocracy and middle class attempts to prevent economic developments that might undermine their privileges. Hence Anthony Crosland's allegations in a 1971 Fabian society pamphlet about the conservation lobby being hostile to growth and having a manifest class bias that "*reflects a set of middle- and upper-class value judgements [for which] preservation of the status quo is the sole consideration*" (Crosland 1971). All large scale developments in rural areas will bring benefits and costs to different sections of society, and nuclear power was no exception. Communities were often divided over the issue, but the more vocal and well organized middle classes, organized into ad-hoc amenity societies, were better able to put their views across and drown out less well articulated working class support (Lowe 1977: 53). This occurred in 1956 over the Bradwell and Hunterston nuclear stations - see Luckin (1990: 175) for details of class conflict at Bradwell. Welsh acknowledges, as many argued at the time, that the objectors at Bradwell and Hunterston could represent an attempt to protect commercial and landed interests. However he comments (2000: 89):

*"Whilst these may have formed the kernel of the objectors position the evidence presented here demonstrates that they quickly attracted layer upon layer of public concern over nuclear power and the ability of democratic institutions to maintain democratic process in the face of the technology. These are themes which have never disappeared but have grown over time".*

Later in the late 1970s, with the mushrooming of local groups opposed to proposed nuclear power stations, there were again accusations of NIMBYism with one sympathetic commentator saying "*The people who join such groups would probably oppose a coal fired power station or an airport on the same site, and many are not perhaps, strictly anti-nuke*" (Weightman 1979).



Ian Welsh however, defends local middle class opposition (in the early 1980s) to nuclear power stations from charges of NIMBYism, characterized he says by the media as “*piece-meal, irrational responses based in parochial concerns*”(Welsh 2000: 211). He argues that such local groups recognized the importance of opposing nuclear power nationally and hence developed links to a network of anti-nuclear organizations, such as the Anti-Nuclear Campaign (ANC) or SCRAM (Welsh 2000: 198). Thus while local nuclear opposition can be seen as NIMBY, it can redeem itself (in the eyes of sympathetic commentators) if it is willing to become part of a national network opposing nuclear power. To cynics this is simply ‘greenwash’ the adoption of an environmental position to further self-interest.

### **8.1.2 Vested interest**

The coal miners had a clear economic or ‘vested interest’ in opposing nuclear power, due to their determination to stop job losses in their industry. This opposition, by the coal miners, their union the NUM, their supporters in the Labour Party and the National Coal Board (NCB), in the mid 1960s to the expansion of nuclear power at the cost of coal has been overlooked by most historians of the anti-nuclear movement, and is covered in Chapter 2. The campaign was led by Alf Robens and Fritz Schumacher, at the National Coal Board, in the 1960s but ended in defeat in 1968. Robens, the NCB Chairman, wished to protect the coal industry from a too rapid shut down, and argued vociferously that nuclear power was being unfairly subsidized. Particular significance was the role played by Fritz Schumacher, then chief economist at the NCB, and later after the publication of his best seller *Small is Beautiful* (1973) a leading spokesman for the environmental movement. Schumacher had a longstanding opposition to nuclear power dating back to the mid 1950s and he was actively involved in the 1970s campaign. Opposition to nuclear power from sections of the NUM continued in the 1970s with Arthur Scargill, its President, involved in the creation of Energy 2000, which was part of the opposition at the Windscale Inquiry in 1977.

### **8.1.3 Intellectual dissent**

There was criticism of nuclear policies and siting based on aesthetic, ecological, ethical and economic reasons but these were until the mid 1970s largely confined to academic journals and small movement publications. There has always been critics of the government’s nuclear policies, but these were brushed aside by the nuclear institutions determined to proceed with their plans. Dissent initially came from industry insiders, concerned about the feasibility of too rapid an expansion of the industry (Stretch 1958; 1961) followed by criticism from academics critical of nuclear economics (Goldring 1964) and the AGR reactor choice (Burn 1967). There was little public discussion of radiation or safety issues, until Schumacher raised the issue in a



speech in 1967, which proved highly controversial but was quickly forgotten (Schumacher 1967a). Few people saw the linkages between nuclear weapons and nuclear power, and whilst the public were fully aware of, and campaigned against, the dangers from radiation 'fallout' from nuclear testing, they appeared unaware of radiation emissions from nuclear power plants.

This changed in the early 1970s due to the books from the United States by Curtis and Hogan (1969), Gofman and Tamplin (1971), and from Germany by Graeb (1972) which publicized the safety hazards and dangers of radiation emissions from nuclear power plants. These arguments were quickly adopted by American campaigners against nuclear plants, who had initially relied on ecological arguments about 'thermal pollution', disturbance of habitat and aesthetic damage to the landscape.

The concerns of Sternglass over the hazards of low level radiation were given prominence by the national press in Britain, and were raised during the debate over the proposed Stourport reactor in 1970 by some of the consultants to the County Council (see Leslie & Shaw 1970: Volume 3:5). Very rapidly scientific dissent over 'safe' limits for radiation exposure, and also the unresolved problems over radioactive waste storage, became translated by eco activists into the prime reason for the public to oppose nuclear power.

#### **8.1.4 Opportunistic**

Intellectual critics of nuclear power were also concerned with issues of democracy and equality, seeing nuclear institutions as examples of remote and over bearing bureaucracies that threatened civil liberties and must therefore be curbed (Flood and Grove-White 1976; Jungk 1979). This criticism of the 'nuclear state' built on previous criticism of the modern technocratic state and the power of corporations, such as by Roszak (1968) and Lewis Mumford (1970). Nuclear power in the US thus became a rallying point for New Left and student radicals and other social critics, particularly after the end of the 'campus wars' and demonstrations against the Vietnam War in the early 1970s. <sup>117</sup> Previously the New (and the old) Left had shown little interest in environmental or nuclear power issues, sometime attacking it as a distraction from more serious social issues (Neuhaus 1971; Enzensberger 1974). In the US protest against nuclear power (like environmentalism) was seen as a middle class provincial movement, concerned with NIMBY issues, whereas in Europe it was seen as a means of uniting peasant farmers with students (Nelkin 1981: 39; Weart 1988: 344). Bupp and Irvine commented on this difference (1978: 198):

*"American opposition to nuclear power crosses traditional ideological and party lines. To a certain extent the same appears to be true in Europe. But there is an important difference. In Europe opposition to nuclear power has become a means to achieving more fundamental ends by true radicals - who often label themselves 'ecologists' - desiring basic*

*change in the economic and social fabric of their societies. In other words, opposition to nuclear power is one of the most effective rallying points around which European social critics gather”.*

This can be seen in Britain by the gradual adoption of the anti-nuclear power by the New Left, starting with the Socialist Workers Party in 1976. It also attracted religious, peace and women's groups who had a long established concern with nuclear weapons.

#### **8.1.4.1 The US Anti PWR campaign**

FoE's anti-nuclear campaign of the 1970s had its origins in the US anti-nuclear movement, since FoE started in California and both its main anti-nuclear campaigners, Patterson and Lovins, were (North) American. Their criticism of nuclear power, particularly the PWR, rested heavily on US evidence and expertise they had gained from attending US hearings. Furthermore it can be argued that this American influence is symptomatic of the general cultural dominance of youth in Britain by the US since the late 1960s, which manifested itself in terms of music, fashion and politics.

The motivations and goals of US and British critics were not always similar. In the US critics need not be 'environmentalists' and vice versa. Bupp and Irvine made these interesting comments on nuclear critics (1978: 198):

*“The motivation and the real objectives of many American and European nuclear critics are not completely clear, but a few generalisations seem safe. A difficult thing for Europeans to understand about American nuclear critics is that some of the most prominent and influential are neither political radicals or even ‘ecologists’ as that label is commonly used in Europe. For them opposition to nuclear power does not go beyond rejection of a specific technology”.*

For instance Duncan Burn (1967), a scathing critic of the UK programme and the British AGR, was very much in favour of the American LWR (on economic grounds). In contrast Lovins and Patterson, in their early criticism, were against the LWR on safety grounds but in favour of the AGR, with Patterson writing in 1972, *“the gas cooled designs are not only more efficient, but more environmentally sound and considerably less suspect on the score of safety”*

(Patterson 1972b: 6). FoE's submission to the Select Committee in 1973, together with media appearances and press articles by Patterson and Lovins, was seen as an attack on the safety record of nuclear power (in the form of the PWR). This appalled nuclear supporters who until then had counted on conservationists for support in their campaign against the poor environmental and safety record of coal. Pocock in his review of the British anti-nuclear campaigners spoke of this bias (1977: 255):



*“It is perhaps significant that the environmentalists groups who were openly critical of the postulated hazards of the nuclear industry were far less outspoken about the actual deaths of coal miners or about the proven long-term dangers of coal wastes such as engulfed Aberfan in 1966 and threatened Trehafod ten years later”.*

However British social concerns over the dangers of coal mining were of no concern to American disputes over PWR safety, which can be seen as a civil war waged on British soil by largely American experts from a branch of an American organization, FoE. A war ultimately directed against the attempt of the ‘nuclear barons’ to make the American PWR the dominant nuclear reactor worldwide (Pringle and Spigelman 1981). Thus it is important to remember in the words of Bupp and Irvine that *“nuclear critics are not always environmentalists, nor are all environmentalists opposed to nuclear power”* (Bupp and Irvine 1978: 198).

## **8.2 The two anti-nuclear campaigns**

In the decade from the mid 1960s to the mid 1970s there were two distinct yet related national campaigns against nuclear power in Britain. The first in the mid 1960 was the campaign by NCB and the miners against the replacement of coal by nuclear power. It was strictly a vested interest campaign, with a clear agenda which used conventional political methods of lobbying. The second was the less focused campaign against nuclear power in the mid 1970s organized by a wide variety of environmental and political groups, using new tactics of street protest. Despite their very different agendas and styles they used very similar arguments against nuclear power. These arguments (detailed in the many policy histories of nuclear power <sup>116</sup>) were:

1. Lack of transparency in nuclear costings
2. Lack of accountability of nuclear executive
3. Excessive secrecy in nuclear discussions
4. Misuse of national resources
5. Opposition to the electrification of the economy
6. Dangers of excessive centralization and monopoly power
7. Existence of desirable alternatives.

New arguments added in the 1970s were:

1. Safety concerns: hazards of radiation and potential for accidents
2. Problems of radioactive waste disposal
3. Dangers from nuclear proliferation and terrorism.
4. Threats to civil liberties from nuclear state.

The first two of these new arguments had been raised by Schumacher in his 1967 lecture, based on concerns raised in the US literature, but at that time they were considered outrageous slurs on

the competence of the British nuclear industry. The last two were 1970s concerns brought about by the use of terrorism by various political groups and some countries in the late 1960s and early 1970s (Flood and Grove-White 1976; Montefiore and Gosling 1977: 61-75).

Both campaigns similarly failed to achieve their goals. They did not make any impact on the political support given to nuclear power. The 1960s campaign was politically far stronger. It was lead by Lord Robens, a former Labour minister and Chairman of the largest nationalised industry, and was backed by many Labour MPs and the NUM, the most powerful trade union. It had unequaled access to the highest levels of Government and the Civil Service. It could, and did, put its message across to those in positions of power. It was inside but not listened to. The prevailing opinion was that coal was finished, nuclear was the future. The only important issue was how to run the coal industry down as humanely as possible. This was the view of most MPs, the media and even most of the NCB. The anti-nuclear campaign was seen as purely vested interest. It also failed to attract any support outside the coal industry; all sections of society being convinced that nuclear was the technology of progress.

The 1970s campaign had far less political support and access. But it had more media coverage and some public support. It had style but no power. It influenced public opinion somewhat but failed to attract established organizations, like business, trade unions or the professions. It was outside and ignored by the establishment. As Jeremy Bugler summed up the achievements of environmentalists in 1981 (Quoted in Vernon 1981: 42):

*“ I am driven to the conclusion that it has been a decade of considerable intellectual achievement and success in consciousness raising, but one of great practical failure. Environmentalists in the UK have failed to prevent Windscale's growth... or indeed an expanded nuclear programme; they have opposed motorways and delayed them for a few years, but in the end the Civil Service has come back to build them”.*

This power of the Civil Service and politicians, to ignore and rebuff attacks on their policy, was also remarked on by Robens who wrote in his biography (Robens 1972: 226):

*“It saddens me to think that the country suffered because the advice I and my colleagues (notably Schumacher) gave was ignored by the civil servants and the politicians. We were regarded as bloody nuisances at the time”*

Schumacher continued to be a ‘nuisance’ to policy makers, taking an active part in the 1970s campaign. His involvement in both campaigns makes him almost unique, and certainly the most famous, amongst conservationists who in the 1960s were almost wholly in favour of nuclear power, viewing it as less polluting than coal. The reason nuclear power was to fall out of favour



with them is almost certainly to do with the voicing of public concern about the dangers of radiation, and this was evident at Stourport in 1970.

### 8.2.1 Stourport Protest

The local debate over the proposed Stourport nuclear power station in 1970 contained all the elements that were to re-occur in the mid 1970s: local risk, national benefit, radioactive dangers and amenity concerns. Despite the local councillors not being able to find any credible scientific or legal grounds on which to oppose the station, they nevertheless persisted in their opposition fueled by a fear of the risks involved (from possible release of radiation).

It could be maintained that this was a NIMBY excuse, that the opposition were looking for any grounds, the more alarmist the better, on which to oppose the building of a power station.

Opposition could be ascribed purely to an 'anti-modernization' fear, mentioned by a local paper as existing in the nearby town of Bewdley over a by-pass proposal (KT&NS 30 January 1970). Undoubtedly there was such an element, and the proposed nuclear station would have had a massive dominance over the town of Stourport. However there was an existing coal fired station at the site, and the Stourport council had lobbied the CEGB for several years to build a new station there. However, even councillors who ended up opposing the nuclear station were not against the building of a new coal fired plant. Cllr. Eric Higgs, secretary of the APS said "*A power station will come, but do we want it to be nuclear or conventional? We would rather have a conventional one*" (KT&NS 5 June 1970).

Thus it was opposition to a nuclear station, rather than to any power plant, that motivated the local councillors. And the driving force behind that opposition to nuclear was fear of radiation, of an accident that would contaminate them. Eric Higgs summed it up as not wanting to live with an 'element of fear'. This fear was long-standing, dating back to the controversy and public debate about the consequences of nuclear fallout from atmospheric tests in the 1950s and early 1960s (Welsh 2000: 90). Radiation after the use of the atomic bomb, had never had a good image. It was something to be feared, a 'deadly invisible menace' (Boyer 1985), or as O'Riordan commented (1986: 44):

*"Radioactivity falls into a specialised class of toxic substances that strikes fear into the public mind because it is unknown, unfamiliar and is associated with lingering death which the innocent cannot avoid".*

Perhaps this image lay dormant in the minds of the councillors for many years, until an event came for it to be confronted. This, combined with dislike of the CEGB's patronizing and arrogance ways, and of its supporters' nuclear hype and phoney claims, laid the basis for what was in essence an emotional, rather than a rational, opposition. It was based on pessimism about

the risks of nuclear power, and typical of this attitude was the objection by Kidderminster Borough Council on the grounds of the possibility of radio-active fallout in the event of accident, they commented “*that the risk is to great a price to pay for benefits*” (WCC 1970: Appendices 9458 p2).

This fear was despite all existing scientific opinion in Britain about the desirability and safety of nuclear power. As the consultants, to the County Council, Leslie and Shaw remarked (1970: Volume 3: 1):

*“We consider that, provided there are no overriding objections to it, the proposal to site an AGR power station at Stourport is in the national interest. The demand for electricity is increasing, and we must hope that the rate of growth of demand will increase as the economy recovers... we feel that, provided the Council is satisfied about the radiation safety aspects of the proposal, a nuclear station is much to be preferred to one fired by a conventional fuel such as coal”.*

The public fears raised at Stourport about the dangers of radiation, were carried over into the public inquiry into the proposed reactor at nearby Portskewett a year later. They were a particular concern to the local women’s group, the Portskewett Young Wives, and were perhaps stoked by media publicity given to Sternglass, such as in The Observer in May 1971. Thus the debate at Stourport and Portskewett in 1970-71 showed that an increasing minority were not satisfied by experts about the ‘radiation safety aspects’, and this concern was to become over the next five years the principal rallying point of the anti-nuclear movement (but not of its movement intellectuals).

### 8.3 Origins of anti-nuclear power attitudes

The reasons for the emergence of the anti-nuclear power movement in the UK in the 1970s are complex. Like all technological evaluations made by the public the reasons were only partly based on what scientists would call a ‘rational’ evaluation of the risks and benefits. There were of course many ‘technical’ concerns, but the movement was at heart an emotional response to ‘nuclear fear’, to dystopian images of an atomic future laid down since the beginning of the 19th century. That the movement emerged in the early 1970s was in part due to opportunistic reasons: the public collapse in confidence in government institutions and authority, as well as internal dissent within the nuclear establishment.

The nuclear proponents in the 1970s persisted (as with the 1957 WHO study) in seeing opposition to nuclear power as simply ‘emotional’. Len Brookes, a leading propagandist for the UKAEA, wrote in 1975 that anti-nuclear feeling was (1975: 95):



*“a largely irrational reaction stemming from deep emotional conviction rather than any dispassionate analysis of the problems and the practical options for dealing with them. [It] relies for its wider support on attitudes that are largely emotional and irrational”.*

In common with elements of Labour Party opinion - as with Crosland (1971)- he saw the anti-nuclear movement as predominately elitist and middle class. This opinion continued through to 1980 with Frank Chapple, the leader of the electricians union, denouncing the (Chapple 1980):

*“Hysterical voices of environmentalists, ecologists and sundry political opportunists, who exploit public ignorance. They re-write all our known experiences with nuclear energy, embellishing every detail, exaggerating every mishap and behind this smokescreen (sometimes euphemistically described as a low energy strategy) they skillfully conceal the fact that the logical outcome of their policies will, at worse, leave us with a shortage of energy around the year 2000 and, at best, lead us first to stagnation and then to reduced standard of living”.*

The source and dynamic of the anti-nuclear opposition may have been emotional but they were not irrational. The author, I believe, who comes closest to identifying the causes of opposition is Spencer Weart who in his book *Nuclear Fear: A History of Images* identifies four main themes in the web of association that influenced the way people thought about nuclear power. These were (1988: 373-4):

1. The technical realities of reactors, both the economic opportunities and the hazards, as seen by scientists and transmitted to the public. From these realities particular ‘facts’, such as on hypothetical radiation dangers, were selected and stressed.
2. Nuclear energy’s social and political associations, especially ideas involving modern civilization and authority. These associations explain what happened when reactors became a condensed symbol for all modern industrial society.

Weart argues that nuclear power was singled out for this symbolic role largely as a result of:

3. The old myths about pollution, cosmic secrets, mad scientists and apocalypse that were historically associated with atomic power and radiation, indestructible myths with deep psychological resonances.
4. The threat of nuclear war, never for a moment forgotten.

Thus to Schumacher the old myths of scientists trespassing on forbidden territory were still valid; writing in 1955 he said (quoted in Wood 1984: 304):

*“Atomic energy for ‘peaceful purposes’ on a scale calculated to replace coal and oil, is a prospect even more appalling than the Atomic or Hydrogen bomb. For here unregenerate*

*man is entering a territory which, to all those who have eyes to see, bears the warning sign 'Keep Out' ”*

For John Davoll it was mistrust of scientific experts (Davoll 1973b):

*“Nuclear power is only part of a even more intimidating nexus of problems related to the use and generation of energy... Can any society so dependent on the advice of experts... have any hope of arriving at informed and democratic decisions on the most vital questions that face it”.*

and pessimism about the ability of humanity to manage vast amounts of nuclear wastes safely for millennia. (Davoll 1973a: 5). Thus in summary this thesis concludes that the anti-nuclear movement was a continuation of protest by a network of activists driven in part by images of the nuclear future as much as by specific fears and concerns.

#### **8.4 FoE Hagiology**

Most of the history of the 1970s anti-nuclear campaign has been written from a FoE perspective, chiefly by Walt Patterson, its main anti-nuclear activist. Another major source of information is from Robert Lamb's hagiology on FoE, which draws heavily on material provided by Patterson - his previous accounts and interviews- with a few quotations from Czech Conroy, in its 7 page account (Lamb 1996: 81-88). Of the five members of the anti-nuclear campaign identified by Tom Burke - Czech Conroy, Mike Flood, Amory Lovins, Walt Patterson, and John Price - John Price is not mentioned in Lamb's book, and none of them are mention in Patterson's two books (according to the index).

In Williams' excellent and impartial account of the Windscale decision, there is wider mention of the FoE team, with the publications of all five being referenced (Williams 1977: 307-310). In two other more partisan histories of nuclear power by Crispin Aubrey (1991) and Fred Roberts (1999), there is no mention of the five by name, though Aubrey in his 'Further Reading' section lists books by Flood (1988) and Patterson (1976, 1985), while Roberts lists books by Patterson (1976, 1985). This aversion to naming people's contribution is one-sided, plenty of people on the pro-nuclear side get mentioned in all accounts. Similarly in discussion of the anti-nuclear groups, FoE is almost invariably the only organization mentioned. Lamb does not mention the campaigns by ConSoc, Half Life, NIN or any of the other groups while Patterson only mentions them in his first account in 1979 and not in his later publications: their account is exclusively FoE- centric. Conroy (1978) in his history of the Windscale campaign makes no mention of ConSoc's involvement (and hardly any of Half-Life), stating only the FoE branch's involvement. While Williams mentions Half Life's campaign three times it is FoE that gets by far the most extensive coverage. Similarly Aubrey mentions Half-Life twice and FoE extensively



(and to be fair many anti-nuclear groups in the 1980s as his book is mainly on the campaign against the proposed PWR at Hinkley).

Thus the existing histories of the anti-nuclear campaign are one sided; while they detail the complexity of the organizations and people on the pro-nuclear side, on the anti-nuclear side there is just FoE, lead by Walt Patterson with help from Amory Lovins and a few others, able to call upon up a mass of amorphous 'environmentalists' to demonstrate. The history thus becomes the myth of 'David versus Goliath', a handful of people battling against the multi-headed nuclear hydra. This myth is reinforced by Patterson's aversion to the contribution of others less intellectually gifted than himself, who he claims 'muddied the waters' with their evidence, allowing Parker to discredit FoE's evidence (1998; also see Lamb 1996: 88). To him the efforts of the other anti-nuclear groups were a big embarrassment, and responsible for the failure of FoE to achieve success at the Windscale Inquiry. That the failure of FoE was, in the words of their contemporary critics, because they were politically naive and too keen on becoming part of the establishment has never been addressed by them (Bugler 1981; Pye-Smith and Rose 1981).

The dominance of FoE in the accounts written by Walt Patterson particularly his 1985 book, together with the media attention to FoE as the premier environmental group opposing nuclear power (achieved by its articulate performance at the Windscale Inquiry) has meant that anti-nuclear histories have been little more than FoE hagiology. It is the intention of this thesis to rectify this, by showing that the anti-nuclear movement in the 1970s was a great deal more complex and diverse than the written accounts indicate.

#### **8.4.1 FoE Expertise v ConSoc democracy**

The Windscale Inquiry made FoE but broke ConSoc. It is somewhat ironic that the methods FoE used to its success- elite lobbying together with rational and highly technical argument - were the antithesis of the values it supposedly stood for as an organization - decentralized, informal and inclusive. In contrast ConSoc stood by its organization values: *democratic decision making* - with members voting and a committee structure- and espousal of environmental values.

FoE was never a democratic organization, it has supporters not members. It was run by the Head Office, with the Director having total control over policy and staff, particular under an authoritarian character like Tom Burke (Undercurrents 1978e). Head office ran campaigns not branches. This was in contrast to ConSoc where members could put forward a policy resolution at the Annual General Meeting and then if accepted could start campaigning. Thus it is no surprise that the anti-nuclear movement started at ConSoc, as it was better able to reflect the concern of members. There may have been similar concern in FoE branches but they had no



mechanism for articulating or acting within FoE until Head Office decided on an anti-nuclear campaign (in late 1975).

FoE head office was an avowedly elitist organization, more concerned with maintaining their reputation for technical competence (and the access that went with it) than combining forces with other groups. This is typified by their decision before the Windscale Inquiry not to ally themselves with any of the other groups but to present their evidence alone. Thus Wynne characterizes much of the conflict amongst groups at Windscale Inquiry as due to *"FoE's unwillingness to co-operate with other groups except on its own terms, and a resultant feeling that the career of FoE as a semi-establishment group took precedence over the more radical sentiments of many of its members"* (Wynne 1982: 100).

As Walt Patterson remarked about the Inquiry (Lamb 1996: 88):

*"If it had been left to us, there was no way that the anti-case could be ignored. I think that it was a successful tactical move by BNFL to invite everybody into the room so that they could get under each other's feet and clutter up the arguments. What happened, there was a huge smear of arguments ranging from the very well worked out to the wildly angry and exaggerated, which left room for Parker to do what he did, to tar everybody with the same brush and say it was totally over the top, indefensible and so on, invoking everybody at the same time".*

Tom Burke commented in 1996 on the impact of the Inquiry *"the lessons from this were only slowly learnt, and some environment groups, like FoE, haven't been able to come to terms with it. [faith in rational argument] At the time we thought we had just lost another battle and hence carried on to do Sizewell"* (Burke 1996). The Report shaped the future debate. FoE was more in favour of technical expertise than democratic access: a result of their organizational structure which concentrated power into the hands of head office staff. This approach won the organization favourable press publicity and enhanced the staff's reputation amongst fellow professionals but it did not win it friends amongst the other fellow organizations (of NIN) and was inimical to building a mass movement. Perhaps this suspicion, even envy, did not matter to FoE: it was at least admired and acknowledged (by the press) as the leader of the anti-nuclear campaign.

ConSoc in contrast decided to become part of a broad umbrella of groups, the WA, at the Inquiry. Its decision to delegate handling of its wide ranging evidence to an ad-hoc group, the WA committee, was a disaster for ConSoc. It won no favourable publicity and lost prestige to FoE. But as Wynne commented on the Windscale Inquiry *"The objectors were in an impossible position: if they took the wider view, the Inquiry would be swamped and Parker would not take*



*them seriously; if they took the narrower approach, they would disappear from the political debate*” (Wynne 1982: 108). This conflict between expertise (or rationality) and democracy (or emotion) always plagues campaigns and organizations. To be successful a balance needs to be struck, in the words of Martin Ince, between the *“rather ill-matched types of activist, in a word, the public inquiry type and the street campaigner”* (Ince 1978). Without the first, found at Head Office, there is no credible case and no favourable publicity; without the second there is no mass organization, campaign or movement.

The anti-nuclear power movement of the 1970s used FoE’s Head Office as their brains and a widely disparate group of environmental and radical activists as their feet. Its success was that it produced in the three years, from March 1975 to April 1978, a movement capable of mobilising over 10,000 people to march in London, and several thousand to camp the weekend at Torness, Scotland. Its tragedy, or irony, was that this movement had nowhere directly to go - its focus the expected Fast Breeder Inquiry was scrapped. As new issues arose, the movement merged itself from 1979 into such ‘direct action’ organizations as the Torness Alliance, CND, ANC and Greenpeace. Both ConSoc and FoE were unable to capitalize on this new mood of militancy because their leaders, John Davoll and Tom Burke, were personally opposed to direct action (Vole 1978c; Bugler 1981: 296; Davoll 1999).<sup>119</sup> The result was that ConSoc went into a long period of decline, as members drifted away, and it was wound up in 1987. FoE however continued to expand and was to play a significant role at future nuclear inquiries at Sizewell and Hinkley. Like the Windscale Inquiry, these two were similarly lost.

#### **8.4.2 FoE retrospective**

The Windscale Inquiry has assumed that status of an epic battle, nearly won, amongst FoE hagiographers. As Czech Conroy reminisces about Windscale to Lamb (1996: 88):

*“It’s true that we lost, but we gained a great deal in the process. There was a massive raising of public awareness about nuclear issues because of the daily media coverage and there was a big jump in the credibility of Friends of the Earth. They couldn’t dismiss us as eco-freaks any more”.*

Conroy also points out that it established a significant precedent, that of holding a public inquiry when considering any major nuclear development and this delayed the progress of the nuclear industry, particularly over plans to build the Sizewell PWR. Furthermore Conroy believes that FoE’s anti-nuclear campaign (Lamb 1996: 88):

*“...was one of the most effective campaigns Friends of the Earth ever ran, especially when you consider what we were up against. Britain was a world leader in nuclear technology,*

*with both civil and military programmes. To stop the expansion of the civil industry in only twenty years of campaigning was an incredible feat”.*

Walt Patterson, commenting on Windscale Inquiry two decades afterwards, believes that if FoE had not opposed THORP and gone to the Inquiry, BNFL would have started building in 1976, with the plant perhaps opening in 1982 (Patterson 1998). That would have resulted in the accumulation of far more plutonium, and there also would be reprocessing plants in other countries. He believed that FoE’s success was that *“We delayed it by 15 years. We delayed the programme. We achieved a lot and feel proud”* (Patterson 1998). Robert Lamb, FoE’s biographer, is similarly upbeat about their achievements (1996: 88):

*“In retrospect, FoE’s presence at the inquiry had done enormous good raising the organisation’s profile to a level it had never previously achieved and marking it out as the credible voice on nuclear issues. It had severely undermined the case for nuclear power, rattled a powerful but complacent industry and challenged the conventional wisdom that nuclear waste should be reprocessed”.*

However Joe Weston believed that the impact on the FoE movement was devastating. He wrote (1989: 54):

*“The Windscale issue had taken up a whole year and had resulted in many other campaign areas being reduced in terms of their profile and the amount of resources spent on them. The campaign had cost the organization far more than the £100,00 in lawyers and expert witness fees used during the course of the inquiry. For all that time, effort and expenditure the organization had, apparently gained nothing. The groups had been asked to raise money for the campaign and at the end of the day, had received nothing in return”.*

Weston remarked that while the FoE head office believed that having lost, the campaign was over, many in local groups did not accept defeat so easily and continued to oppose local nuclear plants. The energy campaigners of FoE felt excluded from these informal local alliances, such as the Torness Alliance, and saw them as threat, *“as if FoE was in danger of losing its lead over the anti-nuclear movement”* (Weston 1989: 56).

Wynne doubts that the Inquiry changed anything in nuclear policy (1996). Some environmental campaigners did however benefit, learning about doing research, putting evidence forward, forming international links, and creating a name for themselves. As Weston perhaps cynically remarked Inquiries do *“provide campaigners with a stage on which they can display their talents and their arguments”* (1989: 102). But the Inquiry did not raise the profile of nuclear issues amongst the public as there was little media publicity in the mass circulation press like The Mirror, as Inquiries are arcane and intimidating to the public. Wynne in an interview two



decades later, said he had no illusions as he *“never expected to win but he didn’t expect it to be fixed. There was enough evidence for Inspector to write an anti-nuclear case but Parker had a predisposition to accept evidence from Government bodies as they were considered accountable and democratic”* (Wynne 1996).

Wynne however argued that FoE, in its desire to put a compromise case and establish credibility with the government, was outflanked by Parker at the Inquiry. Although it was *“the most seasoned and erudite of the objectors”*, it refused to join the other groups (and the desire of its own local members in NNC) in mounting an anti-nuclear case, arguing instead for delay and the availability of technical alternatives to reprocessing (Wynne 1982: 105). When the Inquiry was widely seen by both the press and parliament as a battle for or against nuclear power, the end result was that FoE’s position *“was not even seen as an alternative political option”* (Wynne 1982: 108). While Bugler gives FoE praise for its high quality work and advocacy on nuclear issues, he believed their Windscale campaign was a failure due to their political naivete, remarking *“If nuclear power has suffered rebuffs, it has been almost entirely from its own mistakes, not through public opposition”* (Bugler 1981: 296).

#### 8.4.3 Emotion versus expertise

Media praise for FoE at the Windscale Inquiry was based on their using a rational approach and rejecting emotional arguments, in contrast to the evidence of many other groups. However a plea for the acceptance of ‘emotion’ as a valid premise for opposition to nuclear power was made by Peter Taylor of PERG, in his evidence at the Windscale Inquiry on the right approach to decision making on complex technical decisions (Breach 1978a: 171). Taylor in his evidence said that we lived in a society ruled by rationalists and reductionists because of our dependence on advanced technology, and therefore there is seldom an opportunity to discuss fundamental alternatives. He said (quoted in Breach 1978a:171):

*“If one were to say “I oppose nuclear power because it threatens the very stuff of life”, one would be branded as emotional and incapable of rational argument ...there is far more scope for interaction if one says “I oppose nuclear power because the disposal of long-lived actinides to geological formations of unproven permeability or long-term structural stability cannot guarantee against radiological hazards due to concentrations in the food chains”.*

*Thus, anyone who can actually say that sentence and get the words right (they do not necessarily have to understand them) may become a front-line protagonist. The others must stay at the back and maintain a dutiful silence whilst their ‘champions’ do battle”.*

Taylor illustrates this point by the testimony to the Inquiry by Barbara Fish, from a small religious commune, who posed simple questions like *“Why must we always live with the blunderings of science all in the name of progress?”* and *“How dare we ‘mere mortals’ reason that our industries and refrigerators are important enough to put the balance [of nature] at stake?”* (quoted in Breach 1978a: 171). As Breach commented *“Such non-scientifically assembled questions lack credibility in a controversy dominated by economic and political ‘fact’ ”*. He further remarked that groups like FoE, for all their use of specialist witnesses and technical evidence *“draw for their support on a very large number of people like Ms Fish and her fellow communards who feel, instinctively, that ‘things’ are going wrong and that the move towards dependency on nuclear power is potentially the final mistake”* (Breach 1978a:172). To the mass of activists the Inquiry was an obscure ritual of expertise in which their ‘champions’ took part, it was not part of their political campaign. As Wynne remarked *“It is easy to forget that the Inquiry parties were a very small elite minority of activists for or against some aspect of nuclear energy... The ‘environmentalist’ may have been in there fighting, but he too was an alien expert more akin to the industry’s experts than the ordinary person”* (Wynne 1982: 169). Brian Wynne, writing after the Windscale Inquiry remarked that participation in public inquiries for interested but less experienced, less organized groups and individuals becomes all the more daunting the technical they become (Wynne 1979: 1079):

*“Representation becomes less and less meaningful the more inquiries are highly elite, professionalised and semi private exchanges between strongly committed adversary parties. More elaborate inquiries may buy more natural justice for professional objectors only at the expense of even more alienation of the wider public”.*

#### 8.4.4 Green Alliance

The tendency to focus on the views of the ‘champions’ - the expert and the elite- rather than the ordinary activists was further reinforced by the founding of the Green Alliance at the end of 1978. This was founded by Liberal peer Tim Beaumont at a meeting on 23 December 1978 at the National Liberal Club, attended by 30 people (Green Alliance 1978). John Davoll and Irene Coates from ConSoc attended, but Davoll did not join, though Edward Dawson did. By March 1979 it had 85 members, mostly the ‘great and the good’ from the environment groups, with hardly any overlap with the NIN activists except for Irene Coates who initially refused to join because of *“the gross disparity of sexual representation”* as only 2 of the initial 30 people invited were women. By March 1979 there were more women, 9 out of 85 members, a sex ration of only 10%, far worse than ConSoc in the 1960s. <sup>120</sup>



There were women activists - 10 out of the 41 member groups of NIN had a women as contact point, there were 8 women in the 29 people attending the 'Windscale post-mortem' NIN meeting in November 1977, but they were overlooked. This tendency to overlook women's contribution still continues. For instance Robert Lamb in his biography of FoE, mentions a Joanna Gordon-Clarke who was 'pipped' for the post of Director of FoE in 1975 by Tom Burke (Lamb 1996: 92). The only other mention of her is on the previous page where she is referred to as 'a former environmental policy manger for the oil and gas multinational BP'; of her contribution to FoE nothing is written. Similarly Renee Chudleigh, the Energy Campaigner and initial leader of the FoE Sizewell team and co-author of two FoE books on the case against the PWR (Flood et al 1980; Chudleigh and Cannell 1983), only get one mention though the Sizewell campaign gets 5 pages (Lamb 1996: 105).

In fairness to Lamb he does give extensive mention to the work of two women activists, Angela King, FoE's original wildlife campaigner and to Iris Webb, FoE Board member and anti-Sizewell campaigner. Regretfully the extent of mention in any historical account will often depend on the individual's published record and availability for interview. Most of the male anti-nuclear activists from the 1970s have gone on to successful careers in academia and journalism. They are ease to trace and to interview (as I have done), besides often having produced their own accounts of their activities. Women activists from the 1970s are not so easy to trace, as I have failed to do.

This is definitely a task for future historians of environmental activism, and has been done for the US by Carolyn Merchant (1985) and Vera Norwood (1993). Also the previously neglected role of women activists against pollution from energy sources is being given increasing attention, ranging from the 19th century campaign by the Ladies Health Protective Association of Pittsburgh against coal smoke, to Mary Sinclair's long and ultimately successful, campaign against the building of a nuclear power plant in Midland, Michigan<sup>121</sup> (Gonzalez 2002: 135-7; Breton 1998: 88-93).

## **8.5 Soft energy utopianism**

As we have seen in Chapter 7, energy technologies have been associated with a mixture of utopian and dystopian viewpoints. Utopian views initially dominate society, but over time there is an wavering of support as promoting institutions fail to deliver the expected benefits and the disbenefits become apparent. Sometimes there is a sudden shift in support for a technology, as sections of society abandon it in response to the impact of new ideologies. This can be seen with nuclear power in the early 1970s, where conservationists and many elements of the New Left quickly switched their allegiances from nuclear to solar energy. Often driven by dystopian fears



of a 'nuclear state' they joined the campaign by the new environmentalists against the expansion of nuclear power.

Solar energy, soon to be rechristened renewable energy, was to be the way forward to a 'sustainable' world. This energy utopianism started in the early 1970s with the AT movement, and its latest expression is in books like *The Solar Economy* by Hermann Scheer (2002). In it he claims that the adoption of solar energy will cause a revolution that will replace our present hierarchical society based on fossil fuels with one which is more democratic and egalitarian. As Fred Pearce remarked in his review "*Scheer's is a heady Utopian vision*" (Pearce 2002).

So at the beginning of the 21st century is solar energy to be the future energy source?

Ultimately does it matter? Does choice of energy technology really affect how society is organized? Is Scheer correct when he claims that history shows that new technologies, like electric grids and nuclear power, have caused a technological revolution that have reshaped the world. The history of energy utopianism in fact, I believe, shows the opposite: new energy sources do not automatically bring desirable social and economic change. Rather it is the way society is organized, or in the classic Marxist phrase 'who controls the means of production', which determines the scale and nature of the impact of energy technologies. All energy utopianism suffers from the flaw of 'technological determinism', a point made by social critics of technology in the 1960s (Cross et al 1974).

In an era of global capitalism energy sources are likely to be part of a globally traded energy network. This could be the 1960s vision of Buckminster Fuller for a global electricity grid based on solar energy coming from deserts, or more recent ones for a hydrogen economy based on wind, hydro or nuclear power. Whilst economic control of energy systems may still rest in corporate hands the physical infrastructure of energy generation is becoming more decentralized, under the impact of much smaller sized generating plant. For the UK this trend will undoubtedly continue, strengthened by Government policy in its latest Energy White Paper for far more renewables and small-scale distributed electricity generation (DTI 2003). Whether this energy decentralism will bring the social and political benefits desired by solar supporters is uncertain, and is certainly not automatic. Unless there are other Government policies in support of political and economic decentralization the world they aspire to may thus remain solely in the realm of utopian or science fiction writers, or occasional 'islands' of greenness always vulnerable to conquest by outside forces.<sup>122</sup>

#### 8.5.1 A nuclear revival?

So does the history of the anti-nuclear power movement in the 1970s have any lessons for nuclear protest in the 21st century, or teach us anything about why people protest against new



energy technologies. Does the current protest against windfarms have anything in common with previous protest against nuclear power plants? Can the promoters of wind learn anything from the experiences of the 1970s nuclear promoters? Does the Civil Service, as Bugler claimed, always in the end get its way, despite a few years of delay caused by opposition (quoted in Vernon 1981: 42)?

The wind power debate is similar in rhetoric and tone to the nuclear power debate in the 1970s, although public opinion is far more in favour of wind power than it ever was of nuclear power. Just as the nuclear lobby in the 1970s could not conceive or accept the fact that people did not want any nuclear power stations (and wanted to close down existing ones), so much of the wind lobby is unable to accept the rationality of opposition. For instance the BWEA (British Wind Energy Association) uses the same language, as was used by nuclear promoters in the 1970s, of *“misconceptions and misinformations distributed by groups aiming to stifle wind energy development completely”* and *“a small but vociferous number of people have generated a disproportionate amount of press coverage”* (quoted in Elliott 1997: 163-4). Similarly wind promoters call for education, well informed debate and local consultation and an end to NIMBYism. The technology is different but the debate and language is the same.

Just as the nuclear establishment was split in the 1970s, so there are divisions amongst ‘environmentalists’ over windfarms. This division could reflect NIMBY concerns, with some local and regional groups in areas where wind farms are planned being opposed, whilst all the big national groups are in favour. Long established regional groups, like the CPRW (Council for the Protection of Rural Wales), are seeking the protection of the countryside based on the aesthetics of landscape, whilst national groups (RSPB, WWF, FoE, Greenpeace, SERA etc) are united in seeing windpower as a symbol of a sustainable Britain.<sup>123</sup> What needs to be understood is that opposition to wind, like that to nuclear, is partly a political protest, against the (social) vision of its promoters. Some people simply do not like or want a ‘sustainable Britain’ or a ‘soft energy future’, just as some did not want a ‘nuclear state’ or ‘breeder economy’ in the 1970s. This protest can be considered as partly intellectual and partly opportunistic, and is supported by those sections of the media opposed to the energy and social policies of the current Labour Government (Marren 2003). Wind, like nuclear, power is promoted not just as an energy technology but as a means by which its supporters can achieve their social goals, hence the utopianism of Hermann Scheer (2002).

So could anti-wind campaigners change environmentalism towards the old preservation ideas (or perhaps deep green approach) of the protection of ‘Nature’ rather than ‘Man’? Could conservation groups concerned with rural protection, like the CPRW and the CPRE, return to

their 1960s support for nuclear power with their argument that it is better to damage already blighted urban areas rather than 'unspoilt' rural areas, with its unspoken assumption that it is better to subject people to some hazard rather than sacrifice nature? This seems unlikely, for much as they may wish for an energy source that does not 'spoil' the countryside, the options are limited: nuclear is too expensive and is not supported by Government, whilst fossil fuels are accused of causing global warming. A nuclear revival is unlikely, at least for the UK, unless:

1. Renewables fail to deliver technically and economically causing the 'environmental establishment' to become split on energy policy.
2. The public become disillusioned with the promises of solar utopianism.
3. Minority countryside concerns are taken up by the urban majority.

Thus it seems likely the age of expansion for nuclear power is over, although, of course, whatever happens we will still have large amounts of nuclear waste to remind us of its history. Likewise the dream of a utopian society will still be with us, but the energy source through which it is expressed will change over time. The old vision of nuclear power may be over, but the dream of a utopian energy technology still lives on. Renewables is the current favourite, but whether it will be any more successful than nuclear power remains to be seen.



## References.

- Adams, W. M. 1996. *Future Nature: A Vision for Conservation*. London: Earthscan.
- Adamson, Joy 1960. *Born Free*. London: Collins & Harvill.
- Allaby, Michael 1971. *The Eco Activists: Youth Fights For A Human Environment*. London: Charles Knight & Co.
- Allaby, Michael (ed.) 1994. *The Concise Oxford Dictionary of Ecology*. Oxford: Oxford University Press.
- Anderson, Alison 1997. *Media, Culture And Environment*. London: UCL Press.
- ANS 1970. *Outline of Possible Problems in the Siting of a Nuclear Power Station at Stourport-on-Severn*. Report by Associated Nuclear Services to Planning Committee. Worcestershire County Council. 11 March 1970 [County Records Office. Worcester. Planning Committee Minutes 22 April 1970: 100.].
- Aubrey, Crispin 1991. *Meltdown the collapse of the nuclear dream*. London: Collins & Brown.
- Ayres, Eugene and Charles Scarlott 1952. *Energy Sources: the Wealth of the World*. New York: McGraw-Hill.
- Badash, L. 1979. *Radioactivity in America: Growth and Decay of a Science*. Baltimore: John Hopkins University Press.
- Bagguley, P. 1992. 'Protest, poverty and power: a case study of the anti-Poll Tax movement.' *Sociological Review* 43/4: 693-719.
- Banks-Smith, Nancy 1971. Documentaries on TV. *The Guardian* 14 December 1971: 8.
- Barker, Ken 1977. Letter: What Ant-Nuclear Campaign?. *Undercurrents* 19. January 1977: 17.
- Barr, John (ed.) 1971. *The Environmental Handbook: action guide for the UK*. London: Ballantine/FoE.
- Barrance, Tom 1976. Letter: A Windscale Comment. *Undercurrents* 17. August/September 1976: 27.
- Barry, John and Frankland, E. Gene 2001. *International Encyclopedia of Environmental Politics*. London: Routledge.
- Basalla, George 1980. 'Energy and Civilization'. In *Science Technology and the Human Prospect*, eds. Chauncey Starr and Philip Ritterbush. London: Pergamon Press. pp39-52.
- Basalla, George 1982. 'Some Persistent Energy Myths'. In *Energy and Transport: Historical Perspectives on Policy Issues*, eds. George Daniels and Mark Rose. London: Sage. pp. 27-38.
- Beckmann, Petr 1976. *The health hazards of not going Nuclear*. Boulder, Colorado: Golem Press.
- Berger, Albert 1976. 'The Triumph of Prophecy: Science Fiction and Nuclear Power in the Post-Hiroshima Age'. *Science Fiction Studies* 3 (July 1976): 143-150.
- Berger, John 1977. *Nuclear Power: the unviable option*. New York: Dell Publishing.
- Bertell, Rosalie 1985. *No Immediate Danger: Prognosis for a Radioactive Earth*. London. Women's Press.
- Blowers, Andrew 1980. *The Limits of Power*. Oxford: Pergamon.
- Boffey, Philip 1969. 'Ernest Sternglass: Controversial Prophet of Doom'. *Science* 166 (10 October 1969): 195-200.
- Bolter, Harold 1996. *Inside Sellafield*. London: Quartet Books.
- Boyer, Paul 1985. *By the Bomb's Early Light: American thought and culture at the dawn of the atomic age*. New York: Pantheon Press.
- Boyle, Godfrey and Peter Harper (eds.) 1976. *Radical Technology*. London: Wildwood House.
- Boyle, Godfrey 1983. *Nuclear Power: the Windscale Controversy*. Milton Keynes: the Open University Press.
- Boyle, Godfrey (ed.) 1996. *Renewable Energy: Power for a Sustainable Future*. Milton Keynes: the Open University Press.
- Bramwell, Anna 1989. *Ecology in the Twentieth Century: A History*. New Haven: Yale University Press.
- Brand, Stewart (ed.) 1968. *Whole Earth Catalog: access to tools*. Portola Institute.
- Branley, Franklyn 1959. *Solar Energy*. London. Edmund Ward.
- Breach, Ian 1977a. 'Friends against fission'. *New Scientist* (19 May 1977): 378.
- Breach, Ian 1977b. 'Scientific Evidence on Tap'. *New Scientist* (23 June 1977): 695.
- Breach, Ian 1977c. 'Fremlin and his fish'. *New Scientist* (4 August 1977):
- Breach, Ian 1977d. 'A miner of information' and 'The alternative case'. *New Scientist* (11 August 1977): 342.
- Breach, Ian 1977e. 'Local friends'. *New Scientist* (15 September 1977): 654.
- Breach, Ian 1977f. 'A bad-tempered week'. *New Scientist* (22 September 1977): 716-7.
- Breach, Ian 1977g. 'No agreement on basic issues. *New Scientist* (29 September 1977): 782.
- Breach, Ian 1977h. 'A Socialist alternative'. *New Scientist* (13 October 1977): 72.
- Breach, Ian 1977i. 'Professional opponents move in'. *New Scientist* (20 October 1977): 134.
- Breach, Ian 1977j. 'The last witness'. *New Scientist* (27 October 1977): 206.
- Breach, Ian 1977k. 'Opponents wind up the case against expansion'. *New Scientist* (3 November 1977): 272.
- Breach, Ian 1977l. 'The Windscale exercise'. *New Scientist* (10 November 1977): 332.
- Breach, Ian 1978. *100 days of History: the Windscale Inquiry*. London: New Scientist.
- Breach, Ian 1978a. *Windscale Fallout: A Primer for the Age of Nuclear Controversy*. Harmondsworth: Penguin.
- Breach, Ian 1978b. 'A Great Debate?'. *New Scientist* (26 January 1978) 202.



- Breach, Ian 1978c. 'Case dismissed'....and 'Mr. Justice Parker's uncompromising stand'. *New Scientist* (9 March 1978): 634-635.
- Breach, Ian 1978d. 'After Windscale?'. *New Scientist* (6 April 1978): 4.
- Breach, Ian 1978e. 'Environmentalists after Windscale'. *New Scientist* (27 July 1978): 258-260.
- Breton, Mary Joy, 1998. *Woman Pioneers for the Environment*. Boston: Northeastern University Press.
- Brinkworth, Brian 1972. *Solar Energy for Man*. Salisbury, UK: Compton Press.
- Brookes, Len 1976. 'The Plain Man's Case for Nuclear Power'. *Atom* 234. (April): pp95-105.
- Brooks, Paul 1980. *Speaking for Nature: How Literary Naturalists from Henry Thoreau to Rachel Carson have Shaped America*. Boston, Ma: Houghton Mifflin.
- Brown, S 1970. 'Cockcroft Memorial lecture: The background to the nuclear development programme'. *J of British Nuclear Energy Society* 9: 4-10.
- Bryce Smith et al 1975. 'Letter: Nuclear Dustbin for the Centuries'. *The Guardian* (7 January 1975): 12.
- Bugler, Jeremy 1978a. 'The Windscale Verdict'. *New Statesman* 95 (10 March 1978): 309-10.
- Bugler, Jeremy 1978b. 'Windscale: a case study in public scrutiny'. *New Society* 45 (27 July 1978): 183-6.
- Bugler, Jeremy 1981. 'Friends of the Earth is 10 years old'. *New Scientist* (30 April 1981): 294-7.
- Bunyard, Peter 1970. 'Is there a peaceful atom?'. *The Ecologist* 1/1 (July 1970): 15-19.
- Bunyard, Peter 1971a. 'The Swansong of the Clyde'. *The Ecologist* 1/11 (May 1971): 4-9.
- Bunyard, Peter 1971b. 'Fessenheim- Easter Monday'. *The Ecologist* 1/12 (June 1971): 26-28.
- Bunyard, Peter 1981. *Nuclear Britain*. London: New English Library.
- Bupp, Irvine and Jean-Claude Derraine 1978. *Light water: How the Nuclear Dream Dissolved*. New York: Basic Books.
- Burke, Tom 1978. 'Letter'. *Vole* 2 /1 (October): 51.
- Burke, Tom 1996. interview with author 27 August 1996.
- Burn, Duncan 1967. *The Political Economy of Nuclear Energy*. London: Institute of Economic Affairs.
- Burn, Duncan, 1978. *Nuclear Power and the Energy Crisis*. London: MacMillan.
- Butti, Ken and John Perlin 1980. *A Golden Thread: 2500 Years of Solar Architecture and technology*. New York: Van Nostrand Reinhold.
- Calder, Ritchie 1962. *Living with the Atom*. Chicago: University of Chicago Press.
- Caldicott, Helen 1980. *Nuclear Madness: What you can do*. London: Wildwood House.
- Callenbach, Ernest 1978. *Ecotopia: novel about ecology, people and politics in 1999*. London: Pluto Press.
- CANTO 1976. Press release on Public Meeting in Trafalgar Square on Saturday 20 November 1976. [Sheffield Archives 1993/108 Box 4].
- Carey, James and John Quirk 1970. 'The mythos of the electronic revolution I and II'. *The American Scholar* (Spring 1970): 219-241. (Summer 1970): 395-424.
- Carey, John (ed.) 1999. *The Faber Book of Utopias*. London: Faber & Faber.
- Carson, Rachel 1962. *Silent Spring*. Boston, Ma: Houghton Mifflin.
- Caufield, Catherine 1989. *Multiple Exposures: Chronicles of the Radiation Age*. Harmondsworth: Penguin.
- Caves, Richard E et al 1968. *Britain's Economic Prospects*. Washington DC: Brookings Institution.
- Chapman, Peter 1998. Interview with author 24 April 1998.
- Chapple, Frank 1980. 'Address: to the British Nuclear Energy Society annual dinner, 6 December 1979'. *Nuclear Energy* 19/2: 75-76.
- Chudleigh, Renee and William Cannell 1983. *The PWR Decision: How Not to Buy a Nuclear Reactor*. London: FoE.
- CN 47 1973. 'Liberals adopt Conservation Society Chairman's energy resolution'. *Conservation News* 47 (October 1973): 5-6.
- CN 55 1975. 'Lord Avebury- the Society's President talks to Conservation News'. *Conservation News* 55 (March 1975): 4-8.
- CN 56 1975. 'Lord Robens- talks to Conservation News'. *Conservation News* 56. (June 1975): 3-5.
- CN 61 1976. 'Energy Report'. *Conservation News* 61 (June/August 1976): 13.
- CN 64 1977. 'Energy Report'. *Conservation News* 61 (February/April 1977): 16.
- CN 65 1977. 'Safe Energy Petition'. *Conservation News* 65 (May 1977): 9.
- CN 95 1986. 'The 1986 National Conference'. *Conservation News* 95: 1.
- Coates, Irene 1978a. 'The Problem of Windscale'. *Conservation News* 68 (February/March 1978): 5.
- Coates, Irene 1978b. 'Walking Around Windscale'. *Undercurrents* 29 (August/ September 1978): 4-5.
- Coates, Peter 1998. *Nature: Western Attitudes since Ancient Times*. Berkeley, Ca.: University of California Press.
- Cohn, Steven 1997. *Too Cheap to Meter: an economic and philosophical analysis of the nuclear dream*. Albany, NY: State University of New York Press.
- Commoner, Barry 1966. *Science and Survival*. London. Victor Gollancz.
- Conford, Philip 2001. *The Origins of the Organic Movement*. Edinburgh: Floris Books.
- Conroy, Czech 1978. *What Choice Windscale: the issues of reprocessing*. London. Friends of the Earth and Conservation Society.



- ConSoc 1974a. *Nuclear Power: Salvation or Deathtrap?*. Leaflet 4pp. Chertsey, Surrey: The Conservation Society.
- ConSoc 1974b. *The Conservation Society Annual Report 1974*. Chertsey, Surrey: The Conservation Society.
- ConSoc 1975. *The Conservation Society Annual Report 1975*. Chertsey, Surrey: The Conservation Society.
- ConSoc 1976a. *Working Party Reports: Energy*. Minutes of The Conservation Society National Executive meeting for 1976. Chertsey, Surrey: The Conservation Society. [Sheffield Archives 1993/108 Box 3].
- ConSoc 1976b. *Towards a National Energy Strategy*. Minutes of The Conservation Society National Executive meeting for 1976. Chertsey, Surrey: The Conservation Society. p1976/47. [Sheffield Archives 1993/108 Box 3].
- ConSoc 1976c. *The Conservation Society Annual Report 1976*. Chertsey, Surrey: The Conservation Society.
- ConSoc 1977. *The Conservation Society Annual Report 1977*. Chertsey, Surrey: The Conservation Society.
- ConSoc 1978a. *The Conservation Society Annual Report 1978*. Chertsey, Surrey: The Conservation Society.
- ConSoc 1979. *Financial liabilities incurred by the Conservation Society as a result of its participation in the Windscale Appeal*. Report to Council from the Principal Officers and Director. Chertsey, Surrey: The Conservation Society. [Sheffield Archives 1993/108 Box 3].
- Cook, Charles 1976. '18,000 back nuclear fuel plant'. *The Guardian* 20 November 1976: 5).
- Cotgrove, Stephen 1982. *Catastrophe Or Cornucopia: The Environment, Politics And The Future*. Chichester: Wiley.
- Cottrell, Fred 1955. *Energy and Society: the Relations between Energy, Social Change and Economic Development*. New York. McGraw Hill.
- Croll, J and D Buck 1976. 'Nuclear Power: Fuel for Capitalism'. *Science for People*, 33. November 1976.
- Crosland, Anthony 1971. *A social democratic Britain*. London: Fabian Society.
- Cross, Nigel, David Elliott and Robin Roy 1974. *Man-Made Futures: readings in Society, Technology and Design*. London: Hutchinson.
- Crown, Sheryl 1979. *hell no, we won't glow*. London: Housmans.
- Curtis, Richard and Elizabeth Hogan 1969. *Perils of the Peaceful Atom*. New York: Doubleday.
- Daniels, Farrington 1949. 'Solar Energy'. *Science* 109: 51-57.
- Daniels, Farrington 1950. 'Atomic and Solar Energy'. *American Scientist* 38 (October): 521-48.
- Daniels, Farrington 1964. *Direct Uses of the Sun's Energy*. New Haven: Yale University Press.
- Daniels, Farrington, M. King Hubbert and Eugene Wigner 1949. 'Our Energy Resources'. *Physics Today* (2 April):18-22.
- Davoll, John 1973a. 'Letter'. *Conservation News* 45 (April 1973): 5.
- Davoll, John 1973b. 'Review: Nuclear Reactors.' *Conservation News* 47 (October 1973): 14.
- Davoll, John 1999. Interview with author 15 January 1999.
- Davy, John 1970a. 'Atomic Waste'. *Span* May 1970.
- Davy, John 1970b. 'Kansas Nuclear Park'. *Span* September 1970: 5.
- Davy, John 1971. 'Column: Science and Survival'. *Span* May 1971: 5.
- Della Porter, D and M Diani 1999. *Social movements: an Introduction*. Oxford: Blackwell.
- Dickson, Peter 1974. 'Plutonium Nightmare'. Part 1 *Conservation News* 53 (November 1974) and Part 2 *Conservation News* 55 (March 75).
- Dietz, David 1945. *Atomic Energy in the Coming Era*. New York: Dodd Mead.
- Doherty, Brian, Mathew Paterson, and Benjamin Seel 2000. 'Direct Action in British Environmentalism'. In *Direct Action in British Environmentalism*, eds. Benjamin Seel, Mathew Paterson, and Brian Doherty. London: Routledge. pp1-24.
- Downey, Gary 1986. *Looking for Anomalies: the Union of Concerned Scientists as Technological Revolutionaries*. Talk presented at the Society for History of Technology meeting, Pittsburgh 25 October 1986.
- DTI 1971a. *Report of Public Inquiry Concerning the Proposed Connah's Quay "B" Nuclear Power Station*. London: Dept of Trade and Industry.
- DTI 1971b. *Report of Public Inquiry Concerning the Proposed Nuclear Power Station at Portskewett, Chepstow, Monmouthshire*. London: Dept of Trade and Industry.
- DTI, 2003. *Our Energy Future- creating a low carbon economy*. London: Department of Transport and industry. [2003 Energy White Paper].
- Dubos 1960. *Mirage of health - utopias, progress and biological change*. London: George Allen & Unwin.
- Dubos, Rene 1968. *So Human an Animal*. London: Rupert Hart-Davis.
- Easlea, Brian 1983. *Fathering the Unthinkable: Masculinity, Scientists and the Nuclear Arms Race*. London: Pluto Press.
- Ebbin, Steven and Raphael Kasper 1974. *Citizen Groups and the Nuclear Power Controversy: Uses of Scientific and Technological Information*. London. MIT Press.
- Economist Intelligence Unit 1968. *Report for NCB*. London: Economist Intelligence Unit.
- Ehrlich, Paul 1968. *The Population Bomb*. London: Ballantine.
- Ehrlich, Paul 1970. 'Eco-catastrophe!'. *Resurgence* 3/3. (September-October) p19-24.



- Elliott, Dave 1978a. *The Politics of Nuclear Power*. London: Pluto Press.
- Elliott, Dave 1978b. 'After Windscale'. *Undercurrents* 28 (June-July 1978): 9.
- Elliott, Dave 1997. *Energy, Society and Environment*. London: Routledge.
- Elliott, Mary 1977. *Ground for Concern: Australia's Uranium and Human Survival*. Penguin.
- Enzensberger, Hans Meyer 1974. 'A Critique Of Political Ecology'. *New Left Review* 84 (April): 3-31.
- Eyerman, Ron and Andrew Jamison 1990. *Social Movements: A Cognitive Approach*. Cambridge: Polity Press.
- Eyerman, Ron 1983. 'Intellectuals and Popular Movements'. *Praxis International* 2/3: 185-198.
- Fitter, Richard and Peter Scott 1978. *The Penitent Butchers: 75 years of wildlife conservation*. London: Collins.
- Flam, H (ed.) 1994. *States and Anti-nuclear Movements*. Edinburgh: Edinburgh UP.
- Fleming, Donald 1972. 'Roots of the New Conservation Movement'. In *Perspectives in American History*, eds., Donald Fleming and Bernard Bailyn. Cambridge: Cambridge University Press. Volume 6: 7-91.
- Flood, Mike and Robin Grove-White 1976. *Nuclear Prospects: a Comment on the Individual, the State and Nuclear Power*. London: FoE with CPRE and NCCL.
- Flood, Mike 1988. *The End of the Nuclear Dream*. London: FoE.
- Flood, Mike 1996. interview with author 4 September 1996.
- Flood, Mike, 1980. *The Big Risk: Nuclear Power*. London: Friends of the Earth.
- Foley, Gerald 1996. Interview with author 4 September 1996.
- Ford, Daniel 1982. *The Cult of the Atom*. New York: Simon & Shuster.
- Francis, John and Paul Abrecht (eds.) 1976. *Facing Up to Nuclear Power*. Edinburgh: St Andrews Press.
- Freeman, Leslie 1981. *Nuclear Witnesses: Insiders Speak Out*. New York: WW Norton.
- Fremlin, J. H. 1972. 'Letter'. *The Ecologist* 2/7 (July 1972): 22.
- Fremlin, J. H. 1973. Letter. *Conservation News* 44 (January 1973): 13.
- Fremlin, J. H. 1975. 'Letter'. *Conservation News* 54 (January 1975).
- Fremlin, J. H. 1978a. 'Letter'. *Conservation News* 69 (May/July 1978): 11.
- Fremlin, J. H. 1978b. 'Letter: Windscale Inquiry'. *Conservation News* 70 (August/October 1978): 5.
- Fremlin, J. H. 1987. *Power Production: what are the risks?*. Oxford: Oxford University Press.
- GA 1991. 'Earth First Block Nuke'. *Green Anarchist* 28: 24.
- Gabor, Dennis 1964. *Inventing the Future*. Harmondsworth: Pelican.
- Geddes, Donald 1945. *The Atomic Age Opens*. New York: Pocket Books.
- Gillette, Robert 1972. 'Nuclear Safety: The Roots of Dissent'. *Science* 177: 771-776.
- Girling, Richard 1996. 'Junk that scars the skyline'. *The Daily Telegraph* 7 December 1996.
- Gitlin, Todd 1987. *The Sixties: Years Of Hope, Days Of Rage*. New York: Bantam.
- Gofman, John 1979. *"Irrevy": An Irreverent, Illustrated View of Nuclear Power*. San Francisco: Committee for Nuclear Responsibility.
- Gofman, John 1983. *Radiation and Human Health*. New York: Pantheon.
- Gofman, John and Arthur Tamplin 1970. *"Population Control" through Nuclear Pollution*. Chicago: Nelson Hall.
- Gofman, John and Arthur Tamplin 1971. *Poisoned Power: the case against nuclear power plants*. Emmaus, Pa.: Rodale Press.
- Goldring, Mary 1964. 'Replanning Britain's Nuclear Energy Programme'. *J. of British Nuclear Energy Society* January 1964: 11-15.
- Goldsmith, Edward, Bunyard and Hildyard 1978. 'Reprocessing the truth: *The Ecologist* analyses the Windscale Report'. *New Ecologist* 3.
- Gonzalez, George 2002. 'Local Growth Coalitions and Air Pollution Controls: The Ecological Modernisation of the US in Historical Perspective'. *Environmental Politics* 11/3 (Autumn 2002): 121-144.
- Gottlieb, Robert 1993. *Forcing the Spring: The Transformation of the American Environmental Movement*. Washington DC: Island Press.
- Gould, Peter 1988. *Early Green Politics: back to nature, back to the land and socialism in Britain*. Brighton. Harvester Press.
- Goulder, Alvin 1979. *The Future of Intellectuals and the Rise of the New Class*. New York: Seabury.
- Gracub, Ralph, 1974. *The Gentle Killers: Nuclear Power Stations*. London. Abelard-Schuman.
- Graham, Frank 1970. *Since Silent Spring*. London: Hamish Hamilton.
- Grant, Margaret 1980. 'Where is the anti-nuclear movement marching to?'. *Vole* 3/6 (13 March 1980): 6-7.
- Green Alliance, The 1978. *Draft Minutes of the Founding Meeting of the Green Alliance*. London: the Green Alliance. [Sheffield Archives 1993/108 Conservation Society].
- Greenberg, Dolores 1990. 'Energy, Power and Perceptions of Social Change in the Early Nineteenth Century'. *American Historical Review* 95/3: 693-713.
- Greer, Jed and Kenny Bruno 1996. *Greenwash: The Reality Behind Corporate Environmentalism*. New York: The Apex Press.
- Grove-White, Robin 1996. Interview with author 24 September 1996.



- Guardian, The 1978. *Windscale: A summary of the Evidence and The Argument*. London: Guardian Newspapers Ltd.
- Guha, Ramachandra 1996. 'Lewis Mumford, the Forgotten American Environmentalist: An Essay in Rehabilitation'. In *Minding Nature: The Philosophers Of Ecology*, ed. David Macauley. NY: Guildford Press. pp209-228.
- Gyorgy, Anna and friends 1979. *No Nukes: everyone's guide to nuclear power*. Boston, Ma: South End Press.
- Halacy, D.S. 1957. *Power from the Sun: the Story of Solar Energy*. London: J. Murray.
- Halacy, D.S. 1963. *The Coming Age of Solar Energy*. New York: Harper & Row.
- Half Life 1975. 'Long Live Half Life'. *Undercurrents* 12 (September/October 1975): 2.
- Hall, Tony 1986. *Nuclear Politics: the History of Nuclear Power in Britain*. Harmondsworth: Penguin.
- Hannah, L. 1979. *Electricity before Nationalisation*. London: Macmillan.
- Hansen A. (ed.) 1993. *The Mass Media And Environmental Issues*. Leicester University Press.
- Hardin, Garrett 1968. 'The Tragedy of the Commons: the population problem has no technical solution....' *Science* 162: 1243-8.
- Harper, Peter 1972. 'Stockholm - POWOW acts as UN evades the issues'. *Undercurrents* 2 (May 1972).
- Hart, Joseph 1924. 'Power and Culture'. *The Survey Graphic* Number 51/1 (March 1924): 625-9.
- Hawkes, Nigel 1975a. 'Danger- Radioactive Waste.' *Observer* 23 March 1975: 11.
- Hawkes, Nigel 1975b. 'Swedes dump atom waste on Britain.' *Observer* 20 April 1975: 3.
- Hay, Peter 2002. *A Companion to Environmental Thought*. Edinburgh: Edinburgh University Press.
- Hays, Samuel 2000. *A History of Environmental Politics since 1945*. Pittsburgh: University of Pittsburgh Press.
- Hays, Samuel 2002. *Session Comment: Environmentalism Unbound; Dimensions of the Environmental Movement*. ASEH meeting, Denver USA, March 2002.
- Herbert, Nicholas 1970. 'Case against nuclear power'. *The Times* 4 March 1970:10.
- Herring, Horace 1978. *Alternative Technology Directory*. Brighton: Pebble Press.
- Herring, Horace 1996. 'Review: Modern Environmentalism'. *Environmental Politics* 5/4: 777-8.
- Herring, Horace 2001. 'The Conservation Society: harbinger of the 1970s environment movement in the UK'. *Environment and History* 7: 381-401.
- Hilgartner, Stephen, Richard Bell and Rory O'Connor 1982. *Nukespeak: Nuclear Language, Visions And Mindset*. San Francisco: Sierra Club Books.
- Hinton, Lord 1957. 'The Future of Nuclear Power'. *Journal of British Nuclear Energy Conference* July 1957: 292-305.
- Hinton, Lord 1976. 'Two Decades of Nuclear Confusion'. *New Scientist* 71: 200.
- HMSO 1953. *The Future organization of the UK Atomic Energy Project*. Cmd 8986. London: HMSO.
- HMSO 1955. *A Programme of Nuclear Energy*. Cmd 9389. London: HMSO.
- HMSO 1957. *Nuclear generating station (Hunterston)*. Scottish Home Dept. and Dept. of Health, Scotland.
- HMSO 1958. *Report of the Public Inquiry Concerning Proposals to Construct a Nuclear Power Station at Trawsfynydd together with Certain Overseas Transmission Lines*. London: HMSO.
- HMSO 1959. *Report of Public Inquiry Concerning the Proposed Nuclear Power Station, Dungeness, Kent*. London: HMSO.
- Holdgate, Martin 1999. *The Green Web: A Union For World Conservation*. London: Earthscan.
- Holliman, Jonathan 1971. *Consumers Guide to the Protection of the Environment*. London: Ballantine.
- Hollis, Lady 2002. 'Asbestos rules up for review'. *The Daily Telegraph* 6 December 2002: 14.
- Hughes, Thomas and Agatha Hughes (eds.) 1990. *Lewis Mumford: Public Intellectual*. New York: Oxford University Press.
- Hughes, Thomas (ed.) 1975. *Changing Attitudes Towards American Technology*. New York: Harper & Row.
- Huxley, Aldous 1962. *Island*. London: Chatto & Windus.
- Hyams, Edward 1950. *The Astrologer*. London: Longman.
- Ince, Martin 1978. 'After Windscale'. *Undercurrents* 28 (June-July 1978): 8.
- Ince, Martin 1984. *Sizewell Report: What Happened at the Inquiry?*. London: Pluto Press.
- Inglehart, Ronald 1977. *The Silent Revolution: Changing Values and Political Styles Among Western Publics*. Princeton, NJ: Princeton University Press.
- Inglehart, Ronald 1990. *Culture Shift in Advanced Industrial Societies*. Princeton, NJ: Princeton University Press.
- Jevons, Stanley 1865. *The Coal Question: an Inquiry Concerning the Progress of the Nation, and Probable Exhaustion of our Coal Mines*. London: Macmillan.
- Joppke, Christian 1994. *Mobilizing Against Nuclear Energy: A Comparison of Germany and the United States*. University of California Press.
- Jungk, Robert 1979. *The Nuclear State*. London: John Calder.
- Kaku, Michio 1979. 'Ban Nuke Power, Ban Nuke Weapons'. *The Guardian (USA)* 9 May 1979.
- Kemp, Beryl 1975. 'Nuclear Alert'. *Conservation News* 57. September 75: 8.
- Kemp, Beryl 1976a. 'Letter'. *Conservation News* 59. January 1976: 15.



- Kemp, Beryl 1976b. *Report to ConSoc Council*. Minutes of ConSoc 1976/15.
- Kemp, Beryl 1976c. *Report to ConSoc National Executive in March 1976*. Minutes ConSoc 1976/18.
- Kemp, Beryl 1976d. 'What the Working parties are doing: Energy'. *Conservation News* 63 (November 1976): 14.
- Kemp, Beryl 1977. 'Energy'. *Conservation News* 67 (November 1977): 16.
- Kemp, Beryl 1978a. 'Energy' and 'The Parker Report'. *Conservation News* 69 (May/July 1978): 8-9.
- Kemp, Beryl 1978b. 'Letter: Windscale Inquiry'. *Conservation News* 70 (August/October 1978): 5.
- Kemp, David 1998. *The Environment Dictionary*. London: Routledge
- Kenward, Michael 1978. 'Critical reactions'. *New Scientist* 9 March 1978: 636.
- Kenward, Michael 1979. 'Nuclear Needs Enemies'. *New Scientist* 20/27 December 1979: 922.
- Kimber R. and J. Richardson 1974. *Campaigning For The Environment*. London: Routledge & Keegan Paul.
- Kimber R., J. Richardson and S.K. Brookes 1974. 'British Government and the Transport Reform Movement'. *Political Quarterly* 45: 190-205.
- Kirk, Andrew 2002. "'Machines of Loving Grace": Appropriate Technology, Environment and Counterculture'. In *Imagine Nation: The American Counterculture of the 1960s and 1970s*, eds. Peter Braunstein and Michael Doyle. London: Routledge. pp. 353-378.
- Kirk, Geoffrey (ed.) 1982. *Schumacher on Energy*. London: Jonathan Cape.
- Kitschelt, H P 1985. 'New Social Movements in West Germany and the United States'. In *Political Power and Social Theory*, ed. M. Zeitlin. Greenwich, CT: JAI Press.
- Kitschelt, H P 1986. 'Political opportunity structures and political protest: anti-nuclear movements in four democracies'. *British Journal of Political Science* 16:57-85.
- Kohn, Harold 1984. 'Public education'. *Nuclear News* November: 50-51, 55.
- Kumar, Krishan 1987. *Utopia & Anti-Utopia in Modern Times*. Oxford: Blackwell.
- Lamb, Robert 1996. *Promising The Earth*. London: Routledge.
- Langer, Rudolph 1940. 'Fast New World. *Colliers* 106/1 (6 July): 18-19, 54-55.
- Lapp, Ralph 1953. *The New Force*. New York: Harper & Row.
- Laurence, William 1948. 'Paradise or Doomsday'. *Woman's Home Companion* May 1948: 32-33, 74-75.
- Leach, Gerald, 1996. Interview with author 12 August 1996.
- Lenin, V 1920. *Collected Works 1960-70*. Moscow: Progress Publishers 31: 516.
- Leslie, D. C. and J. Shaw 1970. *CEGB Proposal to Site a Nuclear Power Station at Stourport. 3 Volume Report to Planning Committee*. Worcestershire County Council. April 1970. [County Records Office. Worcester. Planning Committee Minutes, 22 April 1970. Appendix. 9548].
- Levy, Eugene 1997. 'The Aesthetics of Power: High Voltage Transmission Systems and the American Landscape.' *Technology and Culture* 38/3 (July 1997): 575-607.
- Lilienthal, David 1946. 'Science and Man's Fate'. *The Nation* 13 July 1946: 41.
- Lilienthal, David 1947. 'We must grasp the facts about the atom'. *The New York Times Magazine* 4 May 1947: 7.
- Lilienthal, David 1963. *Change, Hope and the Bomb*. Princeton, NJ: Princeton University Press.
- Lilienthal, David, 1980. *Atomic Energy: A New Start*. New York: Harper & Row.
- Lovins, Amory 1977. *Soft Energy Paths: Towards a Durable Peace*. Harmondsworth: Penguin.
- Lowe, Philip and Jane Goyder 1983. *Environment Groups In Politics*. London: Allen & Unwin.
- Lowe, Philip 1977. 'Amenity And Equity: A Review Of Local Environmental Pressure Groups In Britain'. *Environment And Planning* 9: 35-48.
- Lowe, Philip 1983. 'Values and institutions in the history of British nature conservation'. In *Conservation In Perspective*, eds. A. Warren & F B Goldsmith. Chichester. John Wiley. pp. 329-52,
- Luckin, Bill 1990. *Questions of Power: Electricity and environment in inter-war Britain*. Manchester: Manchester University Press.
- Makhijani, A. and S. Saleska 1996. *The Nuclear Power Deception: US Nuclear Mythology from Electricity 'Too Cheap to Meter' to 'Inherently Safe' Reactors*. Tacoma, MD: Institute for Energy and Environment.
- Marren, Peter 2003. 'An ill wind for wildlife?', *Daily Telegraph* 15 February 2003: 15.
- Martell, Luke 1994. *Ecology And Society: An Introduction*. Cambridge: Polity.
- Mason, A.C. 1977. 'Letter'. *Conservation News* 65 (May/June) 1977.
- Mathews, R.R. & E.F. Usher 1977. 'CEGB Experience of Public Communication'. In *Nuclear Power and Its Fuel Cycle* 7 (Vienna: IAEA): 145-155.
- Mazur, Alan 1975. 'Opposition to Technological Innovation'. *Minerva* 13: 58-81.
- Mazur, Alan 1981. *The Dynamics of Technical Controversy*. Washington DC: Communications Press.
- McAdam, Douglas 1986. 'Recruitment to high risk activism: the case of Freedom Summer'. *American Journal of Sociology* 92: 64-90.
- McKay, George 1996. *Senseless Acts of Beauty: Cultures of Resistance since the Sixties*. London: Verso.
- McNall, I.M. 1971. 'Letter'. *The Times* 14 September 1971.
- McNeill, John Robert 2000. *Something New Under the Sun*. Harmondsworth: Penguin.
- McRobie, George 1981. *Small Is Possible*. London: Jonathan Cape.



- Mellucci, A 1981. 'Ten hypotheses for the analysis of new movements'. In *Contemporary Italian Sociology*, ed. D. Pinto. Cambridge: Cambridge University Press.
- Mercer, P. 1995. *The UK Directory of Political Organisations*. London: Longman.
- Merchant, Carolyn 1985. 'The Women Of The Progressive Conservation Crusade 1900-1917'. In *Environmental History: Critical Essays in Comparative Perspective* ed. Kenneth Bailes. Lanham, MD: University Press of America. p153-75.
- Metzger, Peter 1972. *The Atomic Establishment*. New York: Simon & Schuster.
- Miller, James 1987. *Democracy in the Streets: from Port Heron to the Siege of Chicago*. New York: Simon & Schuster.
- Ministry of Power 1965. *Fuel Policy*. Cmd 2798. October 1965 [1965 White Paper].
- Ministry of Power 1967. *Fuel Policy*. Cmd 3438. November 1967 [1967 White Paper].
- Mishan, Ezra J 1967. *The Costs of Economic Growth*. London: Staples.
- Mitman, Gregg 1999. *Reel nature: America's romance with wildlife on films*. Cambridge, Mass.: Harvard University Press.
- Montefiore, Hugh and David Gosling eds. 1977. *Nuclear Crisis: a Question Of Breeding*. Dorchester: Prism Press.
- Morris, Michael 1976. 'Rally to call for nuclear debate'. *The Guardian* 15 November 1976: 6.
- Mumford, Lewis 1970. *The Pentagon of Power: Vol. 2 of The Myth of the Machine*. New York: Harcourt Brace Jovanovich.
- Nature Conservancy 1958. *Evidence of the Nature Conservancy for the Public Inquiry into the Proposed Nuclear Power Station at Dungeness, Kent to be held at Lydd, New Romney, Kent, on 16 December 1958*. London: Nature Conservancy.
- Nelkin, Dorothy 1981. 'Anti- nuclear connections: power and weapons'. *Bulletin of the Atomic Scientists* 37/4: 36-40.
- Neuhaus, Richard John 1971. *In Defense of People: Ecology and the Seduction of Radicalism*. New York: Macmillan.
- Neumann, John von 1956. 'Can We Survive Technology'. In *The Fabulous Future: America in 1980*. New York: E.P. Dutton & Co pp. 33-47.
- Neuzil, Mark and William Kovarik 1996. *Mass Media and Environmental Conflict: America's Green Crusade*. London: Sage Publications.
- Neville-Singleton, Pamela and Singleton David 1993. *Paradise Dreamed: How Utopian Thinkers have Changed the World*. London: Bloomsbury.
- New Statesman 1973. 'Sons of the Earth'. *New Statesman* 3 August 1973: 146-148.
- NIN 1976. *Letter: Re possible formation of links between organisations concerned about nuclear matters (energy and/or military)*. 15 December 1976. [Sheffield Archives 1993/108 Box 4].
- NIN 1977a. *Report of meeting April 30 1977*. London: Nuclear Information Network 26 May 1977. [Sheffield Archives 1993/108 Box 4].
- NIN 1977b. *Report of meeting November 26-27 1977*. London: Nuclear Information Network 1977. [Sheffield Archives 1993/108 Box 1].
- Norwood, Vera 1993. *Made From This Earth: American Women And Nature*. Chapel Hill: U Of North Carolina Press.
- Novick, Sheldon 1969. *The Careless Atom*. Boston: Houghton Mifflin.
- Novick, Sheldon 1976. *The Electric War: The fight over nuclear power*. San Francisco: Sierra Club Books.
- NS 1976a. 'Nothing new in the great nuclear waste debate'. *New Scientist* (22 January 1976): 181.
- NS 1976b. 'No sparks fly from demo at Britain's "nuclear dustbin" '. *New Scientist* (29 April 1976): 213.
- NS 1978. ' 'Friends' are enemies of the Parker report'. *New Scientist* (4 May 1978): 275.
- NS 1979. 'Editorial: Time to heed the experts'. *New Scientist* (29 November 1979): 674.
- Nye, David 1994. *American Technological Sublime*. Cambridge, Ma: MIT Press.
- Nye, David 1998. *Consuming Power: a Social History of American Energies*. Cambridge, Ma: MIT Press.
- O'Riordan, Tim 1986. 'The Politics and Economics of Nuclear Electricity'. *Catalyst* 5. 12. 41-53.
- Olson, McKinley 1975. 'Reacting to reactors'. *The Nation* 220 (11 January 1975): 15-7.
- Openshaw, Stan 1986. *Nuclear Power: Siting and Supply*. London: Routledge.
- Orlowski, Avril 1976. 'Nuclear Alert'. *Conservation News* 62 (September/October 1976): 16.
- Osborn, Fairfield 1948. *Our Plundered Planet*. London: Faber & Faber.
- Parry, Renee- Marie 1977. *Letter to Leonard Taltz from Renee- Marie Parry, of People for a Non-nuclear world 5 August 1977*. [Sheffield Archives 1993/108 Box 4].
- Partridge, Martyn 1976. 'Atom Whitewash'. *Undercurrents* 18 (October/November 1976): 23.
- Patterson, Walt and Czech Conroy 1978. *The Parker Inquiry*. London: FoE.
- Patterson, Walt 1970. 'Odourless, Tasteless...and Dangerous: Hazards of Radioactive Waste'. *Your Environment* 1/3 (June 1970): 99-104.
- Patterson, Walt 1972a. 'Last Page', *Your Environment* 3/3 (September 1972): 156.
- Patterson, Walt 1972b. 'The British Atom'. *Environment* 14/10 (December 1972): 2-9.



- Patterson, Walt 1973. *Nuclear Reactors*. London: Earth Island.
- Patterson, Walt 1973a. 'FOE Column: North Sea Oil'. *The Ecologist* 3/4 (April 1973).
- Patterson, Walt 1973b. 'FoE newsletter'. *The Ecologist* 3/8 (August 1973): 311.
- Patterson, Walt 1975. 'A Habit of Silence'. *Environment* 17/3 (April/May 1975): 3-4,40.
- Patterson, Walt 1976. *Nuclear Power*. Harmondsworth: Penguin.
- Patterson, Walt 1976a. 'Japanese Import', *Environment* 18/2 (March 1976): 5, 37-38.
- Patterson, Walt 1977. *The Fissile Society*. London: Earth Resource Research.
- Patterson, Walt 1979. 'Environmental Involvement in British Civil Nuclear Policy', *Journal Institute of Nuclear Engineering* 20/5:158-162.
- Patterson, Walt 1984. 'A Decade of Friendship: The First Ten Years'. In *The Environmental Crisis*, ed. Des Wilson. London: Heinemann.
- Patterson, Walt 1985. *Going Critical: an Unofficial History of British Nuclear Power*. London: Paladin.
- Patterson, Walt 1996. Interview with author 7 November 1996.
- Patterson, Walt 1998. Interview with author 20 February 1998.
- Pearce, David 1978. 'Letter: After Windscale'. *Undercurrents* 31 (December 1978/January 1979): 36.
- Pearce, David, Lynne Edwards and Geoff Beuret 1978. *Opposition to Civilian Nuclear Power and the Role of the Public Inquiry*. Aberdeen: Aberdeen University, Politics Dept. Paper 78-05.
- Pearce, David, Lynne Edwards and Geoff Beuret 1979. *Decision Making for Energy Futures: A Case Study of the Windscale Inquiry*. London: Macmillan.
- Pearce, Fred 1991. *Green Warriors*. London: Bodley Head.
- Pearce, Fred 2002. 'Let the sun shine in'. *New Scientist* 2373 (14 December 2002): 54.
- Pepper, David 1984. *The Roots Of Modern Environmentalism*. London. Routledge.
- Pepper, David 1996. *Modern Environmentalism: an Introduction*. London. Routledge.
- Pink, Jane and John 1974a. 'Nuclear Power: The dangers from long lived radioactive wastes'. *Conservation News* 52 (September 1974): 15.
- Pink, Jane and John 1975. 'Nuclear Power: The dangers from long lived radioactive wastes'. *Conservation News* 54 (January 1975): 18.
- Pink, Jane 1974. 'Safe Energy Petition'. *The Ecologist* 4/10 (December 1974): 387.
- Pink, Jane 1976. 'Grass Roots Picket of National Energy Conference'. *Conservation News* 62 (September/October 1976): 11.
- Pink, Jane 1977. 'Pedal power takes news of safe energy petition to Windscale'. *Conservation News* 67 (November 1977/January 1978): 11.
- Pocock, R.F. 1977. *Nuclear Power*. Surrey: Gresham Press.
- Ponting, Clive 1991. *A green history of the world*. Penguin.
- Price, John and Amory Lovins 1974. *Dynamic Energy Analysis and Nuclear Power*. London: Friends of the Earth.
- Pringle, Peter and James Spigelman 1981. *The Nuclear Barons*. London: Michael Joseph.
- Putnam, Palmer 1948. *Power from the Wind*. New York: D Van Nostrand Co.
- Putnam, Palmer 1953. *Energy in the Future*. New York. D Van Nostrand Co.
- Pye-Smith, Charles and Chris Rose 1981. 'Lost in Fools Paradise'. *Vole* April 1981: 5-6.
- RCEP 1976. *Nuclear Power and the Environment*. 6th Report of Royal Commission on Environmental Pollution. Cmd 6618. London: HMSO. [The Flowers Report].
- Reed, Mathew 2002. 'Review: The Origins of the Organic Movement'. *Environmental Politics* 11/1: 215-6.
- Rivers, Patrick 1974. *Politics By Pressure*. London: Harrap.
- Robens, Lord 1972. *Ten Year Stint*. London: Cassell.
- Roberts, Fred 1999. *60 Years of Nuclear History*. Charlbury. Oxon: Jon Carpenter.
- Roberts, Timmons and Melissa M Toffolon-Weiss 2001. *Chronicles From The Environmental Justice Frontline*. Cambridge: Cambridge University Press.
- Rolston, Holmes 1985. 'Duties to Endangered Species'. *BioSciences* 35: 718-26.
- Rome, Adam 2001. *The Bulldozer in the Countryside: Suburban Sprawl and the Rise of American Environmentalism*. Cambridge: Cambridge University Press.
- Rome, Brian 1979a. *Index on Need..* Bristol: ConSoc. Mimeo 7 October 1979. [Sheffield Archives 1993/108/Box 1].
- Rome, Brian 1979b. *Index to Past Public Inquiries*. Bristol: ConSoc. Mimeo 21 October 1979. (Sheffield Archives 1993/108/Box 4).
- Roszak, Theodore 1968. *Making of a Counter Culture: reflections on the technocratic society and its youthful opposition*. London. Faber & Faber.
- Rudig, Wolfgang and Philip Lowe 1986. 'The Withered 'greening' of British Politics'. *Political Studies* 34: 262-284.
- Rudig, Wolfgang 1990. *Anti-Nuclear Movements: a World Survey of Opposition to Nuclear Energy*. London: Longman.



- Rybczynski, Witold 1980. *Paper Heroes: a Review of Appropriate Technology*. Garden City. New York: Anchor Press.
- Ryle, Sir Martin 1977. 'The economics of alternative energy sources'. *Nature* 12 May 1977.
- Sarnoff, David 1956. 'The Fabulous Future'. In *The Fabulous Future: America in 1980*. New York: E.P. Dutton & Co. pp. 13-31.
- Scheer, Hermann 2002. *The Solar Economy: Renewable Energy for a Sustainable Global Future*. London: Earthscan.
- Schumacher, E. F. 1962. *Some Problems of coal economics*. Paper to a seminar on problems of industrial economics. University of Birmingham 18 January 1962. Reprinted in Kirk 1982: 10-13.
- Schumacher, E. F. 1964. 'Energy supplies - the need for conservation'. *Energy International* September 1964. [Reprinted in Kirk 1982: 1-4].
- Schumacher, E. F. 1966. 'Industrialisation through intermediate technology'. *Resurgence* 1/2 (July/August 1966): 8-12.
- Schumacher, E. F. 1967a. *Clean Air and Future Energy - Economics and Conservation*. Des Vocux Memorial Lecture. Blackpool 19 October 1967. [Reprinted in Kirk 1982: 17-21].
- Schumacher, E. F. 1967b. 'Letter'. *The Times* 25 October 1967. [Reprinted in Kirk 1982: 22-23].
- Schumacher, E. F. 1973a. *Small is Beautiful: a Study of Economics as if People Mattered*. London: Blond and Briggs.
- Schumacher, E. F. 1973b. 'Western Europe's energy crisis - a problem of life-styles'. *Ambio*. [Reprinted in Kirk 1982: 23-25 and 48-53].
- Seaborg, Glenn and W R Corliss 1971. *Man and Atom: Building a New World through Nuclear Technology*. New York: Dutton.
- Searle, John 1972. *The Campus War: A Sympathetic Look at the Universities in Agony*. Harmondsworth: Pelican
- Segal, Howard 1985. *Technological Utopianism and American Culture 1830-1940*. Chicago: University of Chicago Press.
- SERA 1977. Letter to Members, July.
- Sheail, John 1976. *Nature in Trust: the History of Nature Conservation in Britain*. Glasgow: Blackie.
- Sheail, John 1991. *Power in Trust: an Environmental History of the CEGB*. Oxford: Clarendon Press.
- Shipley P. 1976. *Revolutionaries in Modern Britain*. London: Bodley Head.
- Silvertown, Jonathan and Philip Sarre 1990. *Environment and Society*. London: Hodder and Stoughton.
- Simon, Julian and Herman Kahn 1984. *The Resourceful Earth: A Response to Global 2000*. Oxford: Basil Blackwell.
- Smil, Vaclav 1993. *Energy in World History*. Boulder, Co.: Westview.
- Smith, Joe (ed.) 2000. *The Daily Globe: environmental change, politics and the media*. London: Earthscan.
- Smith, Michael 1987. *Pacific Visions: California Scientists and the Environment 1850-1915*. New Haven: Yale University Press.
- Soddy, Frederick 1909. *The Interpretation of Radium and the Structure of the Atom*. London: John Murray 1920.
- Spiers, F.W. 1970a. *Letter to Dr J. D. Williams*. WCC County Health Department. 26 March 1970. [County Records Office. Worcester. Planning Committee Minutes, 22 April 1970: 102.].
- Spiers, F.W. 1970b. *Proposed Nuclear Power Station at Stourport-on-Severn*. Report to Planning Committee. Worcestershire County Council. April 1970 [County Records Office. Worcester. Planning Committee Minutes, 22 April 1970. Appendix. 9468].
- Steinmetz, G. 1994. 'Regulation theory, post-Marxism and the new social movements'. *Comparative Studies in Society and History* 36/1: 176-212.
- Sternglass, Ernest 1969. 'The Death of All Children'. *Esquire*. September.
- Sternglass, Ernest 1973. *Low Level Radiation*. London: Earth Island.
- Stewart, Alice and Jill Sutcliffe 2000. 'Radiation Jigsaw: A Different Picture Emerges'. *Energy and Environment* 11/2: 141-7.
- Stott M. and Peter Taylor 1980. *The Nuclear Controversy - A Guide to the Issues of the Windscale Inquiry*. London: TCPA and PERG.
- Strauss, Lewis 1955. 'My faith in the Atomic Future'. *Reader's Digest* August 1955.
- Stretch, K L 1958. 'Is Britain on the Right Track? A Critique of our Nuclear Power Programme', *Nuclear Power* December pp580-4.
- Stretch, K. L. 1961. *A Power Policy for Britain*. London: Ernest Benn.
- Surrey, John and C Huggett 1976. 'Opposition to nuclear power: a review of international experience'. *Energy Policy* 4/4: 286-307.
- Taitz, Leonard 1977. *Letter to J.H. Goodland 28 February 1977*. [Sheffield Archives 1993/108 Box 4.].
- Taitz, Leonard 1978. *Letter to Beryl Kemp 19 September 1978*. [Sheffield Archives 1993/108 Box 4.].
- Tarrow, S. 1994. *Power in Movement*. Cambridge: Cambridge University Press.
- Taylor, Peter 1979. 'Nuclear Energy - How the odds are stacked against its Opponents'. *Nature* 277: 594-5.



- Times, The 1957. 'Deciding Size of Atom Power Station Programme'. *The Times* February 1957: 5.
- Times, The 1958a. 'Nuclear Power Site Opposed'. *The Times* 9 December 1958: 3.
- Times, The 1958b. 'Nuclear Opposition "Irresponsible" '. *The Times* 16 December 1958: 5a.
- Times, The 1958c. 'Nature Conservancy Reply to Attack over Nuclear Site'. *The Times* 19 December 1958: 4d.
- Times, The 1967. 'Nuclear stations 'hazard to life' '. *The Times* 20 October 1967.
- Times, The 1970. 'Environment Minister faces dilemma over power station'. *The Times* 19 October 1970.
- Tinker 1972. 'Only one earth - or 114?'. *Conservation News* 42 (September 1972):3-7.
- Todd, R.W. and C. Alty (eds.) 1977. *An Alternative Energy Strategy for the United Kingdom*. Machynlleth, Wales: National Centre for Alternative Technology.
- Touraine, Alan 1981. *The Voice and the Eye: an analysis of social movements*. Cambridge: Cambridge University Press.
- Tucker, Anthony 1976. 'Dustbin Politics.' *The Guardian* 22 November 1976: 11.
- Tucker, Anthony 1977. 'Lobby tells MPs to scrap A-power.' *The Guardian* 17 November 1977: 3.
- Udall, Stewart 1988. *The Quiet Crisis and the Next Generation*. Salt Lake City: Gibbs Smith.
- Undercurrents 1975a. 'Why the NUCLEAR POWER PROGRAMME MUST be STOPPED'. *Undercurrents* 9 (January/February 1975): 17.
- Undercurrents 1975b. 'Methinks we do protest too little'. *Undercurrents* 9 (January/February 1975): 25.
- Undercurrents 1975c. 'No Nukes is Good News'. *Undercurrents* 10 (March/April 1975): 1.
- Undercurrents 1975d. 'Where have all the FOE's Gone?' *Undercurrents* 11 (May/June 1975): 5.
- Undercurrents 1975e. 'Nuclear Foes'. *Undercurrents* 12 (September/October 1975): 6.
- Undercurrents 1976a. 'It's Nuclear War! *Undercurrents* 15 (April/May 1976): 3.
- Undercurrents 1976b. ' "Gambling with our Chromosomes" '. *Undercurrents* 16 (June-July 1976): 3.
- Undercurrents 1977c. 'Big Brother' at Hinkley'. *Undercurrents* 25 (December 1977-January 1978): 2.
- Undercurrents 1978a. 'What's On'. *Undercurrents* 26 (February-March 1978): 6.
- Undercurrents 1978b. 'Front ban hits FoE March'. *Undercurrents* 27 (April-May 1978): 1.
- Undercurrents 1978c. 'Civil Now-Disobedient later?'. *Undercurrents* 28 (June-July 1978): 1.
- Undercurrents 1978d. 'Torness SCRAMblers'. *Undercurrents* 28 (June-July 1978): 2.
- Undercurrents 1978e. 'Poland St cull to go ahead'. *Undercurrents* 31 (December 1978-January 1979): 2.
- Veldman, Meredith 1994. *Fantasy, the Bomb and the Greening of Britain: Romantic Protest 1945-1980*. Cambridge: Cambridge University Press.
- Vernon, Jan 1981. *Protecting the environment: grass roots action in Surrey and Newham*. University of Surrey Ph.D. thesis.
- Vogt, William 1948. *The Road to Survival*. New York: William Sloane Associates.
- Vole 1978a. 'Windscandal'. *Vole* 7 (20 April 1978): 7-13.
- Vole 1978b. 'Windscale comes to Trafalgar Square'. *Vole* 9 (18 May 1978): 10.
- Vole 1978c. 'FoE and Friends'. *Vole* 12 (24 August 1978): 1-2.
- Wakstein, Charles 1976. 'Can We Ever Trust the Nuclear Technicians.' *Undercurrents* 16 (June/July 1976):10.
- Wall, Derek 1994a. *Green History: a reader in environmental literature, philosophy and politics*. London: Routledge
- Wall, Derek 1994b. *Weaving a Bower Against Endless Night....* London: Green Party Publication.
- Wall, Derek 1996. *25 Years on the MOVE*. London: Friends of MOVE.
- Wall, Derek 1999. *Earth First! and the Anti-Roads Movement: Radical Environmentalism and Comparative Social Movements*. London: Routledge.
- Wallis, H.F. 1972. *The New Battle of Britain*. London: Charles Knight & Co.
- WCC 1970. *Proposed Nuclear Power Station at Stourport*. Report of Planning Sub-Committee. Worcestershire County Council. 3 April 1970. [County Records Office, Worcester. Planning Committee Minutes April 1970].
- Weart, Spencer 1988. *Nuclear Fear: A History of Images*. London: Harvard University Press.
- Webb, Tony 1980. 'Building the ANC'. *Undercurrents* 38 (February-March 1980): 12-13
- Weightman, Gavin 1979. 'The anti-nuke explosion'. *New Society* 8 November 1979: 310-311.
- Weinberg, Alvin 1971. 'Nuclear Energy: a Prelude to H.G.Wells' Dream'. *Foreign Affairs* 49: 407-418.
- Weinberg, Alvin 1972. 'Social Institutions and Nuclear Energy'. *Science* 177/7 (July 1972): 27-34.
- Wellock, Thomas 1998. *Critical Masses: Opposition to Nuclear Power in California 1958-1978*. Madison, WI.: University of Madison Press.
- Welsh, Ian 1988. *British Nuclear Power: Legitimation and Protest 1945-1982*. University of Lancaster: Ph.D. thesis.
- Welsh, Ian 1998. 'Paul Smoker: A Warrior for Peace'. *The Guardian* 26 January 1998: 13.
- Welsh, Ian 2000. *Mobilizing Modernity: The Nuclear Movement*. London: Routledge.
- Weston, Joe 1989. *The F.O.E. Experience*. Oxford Polytechnic, School Of Planning Working Paper 116. June 1989.
- Wiggs, Richard 1971. *Concorde: the Case Against Supersonic Transport*. London: Ballantine.



- Williams, Roger 1980. *The Nuclear Power Decisions: British Policies 1953-1978*. London: Croom Helm.
- Williams-Ellis, Clough 1928. *England and the Octopus*. Geoffrey Bles.
- Wills, John 2001. 'Welcome to the Atomic Park': American Nuclear Landscapes and the 'Unnaturally Natural'. *Environment and History* 7/4 (November 2001): 449-72.
- Winner, Langdon 1980. 'Building a Better Mousetrap: Appropriate Technology as a Social Movement'. In *Appropriate Technology and Social Values: A Critical Appraisal* eds. Franklin Long and Alexandra Oleson. Cambridge, Ma.: Ballinger. [Reprinted as Chapter 4 in Winner 1986].
- Winner, Langdon 1986. *The Whale and the Reactor: A Search for Limits in an Age of High Technology*. London: University of Chicago Press.
- Wood, Barbara 1984. *Alias Papa: a life of Fritz Schumacher*. London: Jonathan Cape Rome.
- Worster, Donald (ed.) 1988. *The Ends of the Earth: Perspectives on Modern Environmental History*. Cambridge: Cambridge University Press.
- Worster, Donald 1993. *The Wealth of Nature: Environmental History and the Ecological Imagination*. Oxford University Press.
- Wright, Pearce 1970a. 'Fall-out said to have killed 500.000 babies'. *The Times* 27 January 1970: 1.
- Wright, Pearce 1970b. 'Fall-out death theory opposed by experts'. *The Times* 28 January 1970: 10.
- Wyatt, A 1980. 'Inquiries into nuclear energy'. *Atom* 286: 208-11.
- Wynne, Brian 1978a. 'The Politics of Nuclear Safety'. *New Scientist* 26 January 1978: 208-211.
- Wynne, Brian 1978b. 'Nuclear debate at the crossroads'. *New Scientist* 3 August 1978: 349-351.
- Wynne, Brian 1978c. 'Review: Windscale fallout'. *New Scientist* 24 August 1978: 569.
- Wynne, Brian 1979. The Big Inquiry. *New Scientist* 28 June 1979: 1078-9.
- Wynne, Brian 1982. *Rationality and Ritual: the Windscale Inquiry and Nuclear Decisions in Britain*. London: British Society for History of Science.
- Wynne, Brian 1996 Interview with author 18 April 1996.
- Wynne, Brian, Claire Waterton and Robin Grove-White 1993. *Public Perceptions and the Nuclear Industry in West Cumbria*. Centre for Environmental Studies, Lancaster University.

- <sup>1</sup> A discussion of this issue occurred on the ASEH email group H-Environment@H-Net.msu.edu in April 2002.
  - <sup>2</sup> From an interview with Hinton by Ian Welsh in 1981, quoted in Welsh 2000: 64. Hinton was to keep his doubts to himself, and only speak publicly in a House of Lord debate in 1975, and publish them in 1976 in a New Scientist article - see Hinton 1976.
  - <sup>3</sup> Captain Herbert Atkins from Vickers Nuclear Engineering, first put forward his criticism of AEA decisions on the nuclear ship programme in the journal Engineering in June 1959. His criticism of AEA policies in February 1963 to the Working Group on Marine Reactor Research, were disowned the following day by Sir Leslie Rowan, the managing director of Vickers, in a telephone call to Sir Roger Makins, Chairman of AEA, and Atkins was summarily dismissed that day from Vickers. Next day the press carried headlines announcing Atkins' dismissal and a political storm followed, with a subsequent Parliamentary debate where Lord Hailsham the Minister for Science, defended its policies (see Pocock 1977: 137-140).
  - <sup>4</sup> The Nuclear Power Committee, otherwise known as the Powell Committee after its chairman Sir Richard Powell, was set in secrecy in the summer of 1962, issued an interim report in 1964, which formed the basis of a Government White Paper announcing the second nuclear programme (HMSO 1964 Cmnd 2335) but did not present a final report until September 1965 (see Welsh 2000: p126-134, Williams 1980 Chapter 5).
  - <sup>5</sup> Ironically Lord Robens, before being appointed chairman of the NCB in 1960, played a leading part in the construction of the Trawsfynydd nuclear power station as Industrial Relations Adviser to the nuclear consortium, Atomic Power Constructors Ltd., who built it. (Pocock 1977: 172).
  - <sup>6</sup> A short synopsis of the grounds for opposition at each of them based on the Inquiry Report is given in Rudig 1990: 114-117.
  - <sup>7</sup> Tom Driberg gave evidence at the Inquiry on 'amenity' issues, with Welsh describing his submission as 'one of the most articulate cases' put forward by individuals (Welsh 2000: 77). He claimed that the modernity of the power station would clash grotesquely with the antiquity of the marshland environment: "*a building of that sort rising out of our subtly delicate horizontal landscape cannot but be an eyesore*" (quoted in Luckin 1990: 177). Driberg was a supporter of Schumacher since the 1940s, and Schumacher's defence of the coal industry in the 1950s would have endeared him to Driberg, a mining MP[?].
  - <sup>8</sup> For coverage of the opening of Calder Hall by the Queen in October 1956 see Welsh 2000: 56-59. Six months previous the Financial Times issued a special supplement on 'Atomic Energy' on 9 April 1956, which was published with The Times, which was the start of euphoric press coverage.
  - <sup>9</sup> By coincidence protest at Dungeness power station was to feature as the first anti-nuclear event of two future groups, FoE in 1975 and Earth First! in 1991 (on FoE protest see Patterson 1979: 159; on Earth First! protest see GA1991; Wall 1999: 46-7).
  - <sup>10</sup> Schumacher was later to achieve worldwide fame with his book *Small is Beautiful* published in 1973; he died in 1977.
  - <sup>11</sup> Obviously a pseudonym, the Latin phrase 'pro bono publico' meaning for the good of the public.
  - <sup>12</sup> As outlined in a letter to the Clerk of WCC from D.J. Philips, Ministry of Housing & Local Government, 18 February 1970. [County Records Office, Worcester. Planning Committee Minutes, 22 April 1970: 90-91.]
  - <sup>13</sup> Perhaps these are reference to the controversy caused by the claims of Sternglass, which appeared on the front page of The Times on 27 January (Wright 1970a) and on the same day in a Thames TV documentary 'Report on Pollution- And on the Eighth Day' in which he said "*It now looks as if in countries like United States and England as many as one in two children that died before reaching age one died because of nuclear testing*" (Wright 1970a).
- His views were disputed the following day by Professor Joseph Rotblat in a Thames TV debate, and in The Times where Rotblat dismissed Sternglass' theories (Wright 1970b). The only support for Sternglass came from Arthur Tamplin who believed that "*the Sternglass work should cause us to take a more serious look at the potential effects of radiation from whatever source*", and that Tamplin opposes "*those who profess that exposure to low doses of radiation is harmless*" (Wright 1970b).
- The book *Perils of the Peaceful Atom* by Curtis & Hogan had also been reviewed in The Times in March. The reviewer said that the book was "*clearly designed to do for nuclear pollution what Rachel Carson's book *Silent Spring* did for chemical pollution*" (Herbert 1970). Most attention in the review was given to graphic passages from the book on nuclear waste described as "*a violent lethal mixture of short and long-lived isotopes*" kept in storage tanks that could fail with catastrophic consequences (Herbert 1970).
- <sup>14</sup> Both the accidents at Three Mile Island on 28 March 1979 and at Chernobyl on 26 April 1986 occurred in the early hours of the morning due to human error.
  - <sup>15</sup> Protest against the proposed twin AGR at Portsokenwett continued throughout the 1970s, becoming in the late 1970s part of the Severnside Alliance, a coalition of 25 local groups. The Portsokenwett and Sudbrook Action Group, nearest the proposed reactor, had in 1979 just 15 members, of which 8 were active (Weightman 1979).



- <sup>16</sup> Davy was a long time writer on this theme, having published in 1962 an article entitled 'The deadly wastes of nuclear power', also articles in Span in September 1970 and May 1971 (Davy 1970b; 1971).
- <sup>17</sup> See also Peter Harper's criticism (1972) of the Stockholm Conference, and his report on the unofficial forums.
- <sup>18</sup> John Fremlin, Professor of Applied Radioactivity at Birmingham University was a ConSoc member and a prolific letter writer in support of nuclear power. He was also, according to Ian Breach (1977c) a long time CND supporter and helped found BSSRS. In 1976 he was appointed a consultant on radiation risk to the Cumbria County Council, and gave evidence to the Windscale Inquiry. His letters, over the period 1972-78, range from that in The Ecologist in July 1972 (Fremlin 1972) to those in Conservation News Nos. 44, 54, 69 & 70. For a statement of his views see his article 'Let us Conserve' in Conservation News No. 75, November 1979/January 1980, p 12. His book *Power Production: what are the risks?* was published by Oxford University Press 1987.
- <sup>19</sup> ConSoc's interest in energy issues was long standing. Colin Hutchinson, Chairman of ConSoc, had already put forward an Energy Resolution before the Liberal Assembly in 1973 which had been adopted unanimously (CN 47). It urged that "*To ensure that safety, polluting effects and moral justification are taken fully into account before nuclear reactors are allowed to proliferate*" (CN 47).
- <sup>20</sup> For another statement of Lord Avebury's views see the editorial by Lord Avebury on nuclear power in LASER, the Liberal Party magazine on Science and Technology, No.39 (September 1974), pp. 4-5.
- <sup>21</sup> This policy of 'keeping the nuclear option open' has dominated UK nuclear policy since the 1970s, and has been restated in every energy policy review, the latest in the 2003 Energy White Paper (DTI 2003).
- <sup>22</sup> Undercurrents had by far the largest circulation of the new wave of environmental magazine founded in the 1970s. A 1978 Directory described it as (Herring 1978: 9):  
 "The magazine of alternative technology and science with emphasis on self-sufficiency, home electronics, free radio, workers co-ops. Good news coverage on energy, communications, industrial co-ops and the best in radical intellectual thought."
- <sup>23</sup> Royal Commission on Environmental Pollution inquiry on *Nuclear Power and the Environment* was announced on 19 March 1974, and published as 6th Report on 22 September 1976 (HMSO Cmd 6618); often referred to as *The Flowers Report*.
- <sup>24</sup> The PWR (pressurized water reactor) is a type of LWR (Light Water Reactor), the other being the BWR (Boiling Water Reactor), both types were developed in the US. The SGHWR (Steam Generating Heavy Water Reactor) was a British design with only one prototype built at Winfrith, Dorset.
- <sup>25</sup> Pocock is probably referring to such articles as those in The Sunday Times on 18 November and by Amory Lovins on 25 November 1973.
- <sup>26</sup> John Price was a researcher for FoE on energy analysis of nuclear power: see John Price & Amory Lovins, 1974, *Dynamic Energy Analysis and Nuclear Power*, London: Friends of the Earth. He left FoE in the 1970s and went to Australia. Interesting neither Lamb 1996 nor Patterson 1986 mention his work for FoE.
- <sup>27</sup> There had also been stories in many of the main papers about BNFL's plans for new thermal oxide reprocessing plant (THORP) since late 1974: for instance see: Financial Times 13 November 1974, and 31 January 1975, and Observer of 23 March 1975 (Hawkes 1975a); also article, 'Looking to the future of nuclear fuel reprocessing' in Electrical Review, of 7 February 1975, PP 160-1 (Wynne 1982:188 n50).
- <sup>28</sup> See Lancaster Comment of 9 December 1971, p 11-14; for an obituary of Paul Smoker see Ian Welsh (1998) who dedicated his book *Mobilising Modernity* to him.
- <sup>29</sup> See Wynne 1982: 75-78 on the conflict the Windscale proposal caused amongst Cumbrian councilors, most of whom supported a quick decision in favour.
- <sup>30</sup> His wife, Mrs. G.J. Acland was one of the only two county councilors (out of 98) who were sympathetic to the Windscale opponents (Wynne 1982: 80, 195 note 22).
- <sup>31</sup> The issue of local support for THORP was examined in evidence given by the West Cumbria branch of FoE at the Windscale Inquiry (see Breach 1977e).
- <sup>32</sup> Brian Wynne was a lecturer in the School of Independent Studies at Lancaster University. After the Windscale Inquiry, Brian Wynne wrote a series of articles for New Scientist (Wynne 1978a:c). In 1982 his book *Rationality and Ritual* was published on nuclear decision making and the role of public inquiries (Wynne 1982). It contains, in Chapter 6, much detail about the conflicts between the groups, represented at the Inquiry. Wynne received praise from Ian Breach in the New Scientist on 28 July 1977 for putting "*some outstandingly well researched questions*" and his evidence on institutional failure amongst nuclear bodies got a big write up (Breach 1977g). Wynne has continued to write on Windscale and radiation issues (e.g. Wynne et al 1993).
- <sup>33</sup> Sir Frank Layfield was to achieve widespread publicity in the 1980s as the Inspector at the Sizewell Inquiry (see Ince 1984: 1).
- <sup>34</sup> For details of the Torness public inquiry see Patterson 1979: 159, Patterson 1984: 47-8; Lamb 1996: 83.
- <sup>35</sup> Patterson wrote about the North Sea oil campaign in the FoE newsletter in The Ecologist during 1973 (Patterson 1973a and 1973b).
- <sup>36</sup> For extensive details and analysis of action at Torness from 1978-80 see Welsh 2000: 166-80.



- <sup>37</sup> Ten year later, the proposed Hinkley C PWR galvanized local opposition, which became the Stop Hinkley Expansion (SHE) group; see Aubrey 1991: 65-68. In his book however there is no mention of the Nuclear Reactor Vigilantes.
- <sup>38</sup> For an insider's view of the conflict between the groups at the Windscale Inquiry, see the detailed account in Wynne 1982: 100-111.
- <sup>39</sup> For details of the Lawyers Ecology Group's role in influencing the decision to hold an inquiry, see Wynne 1982: 82.
- <sup>40</sup> The letter from Parry to Taitz of 5 August 1977 has scribbled on the bottom PS "*We are just sending another £500 to Beryl Kemp for CONSOC and the same to FOE!*" (Parry 1977).
- <sup>41</sup> According to Ian Breach (1977b), Peter Taylor was a former social anthropologist who had spent six years in industry and teaching. His nuclear expertise had come from acting as an advisor to local citizens' groups opposed to the construction of a reprocessing plant at Aschendorf, West Germany and from working alongside university lobbyist from Bremen.
- <sup>42</sup> John Tyme was a well known, even notorious, anti-roads campaigner who achieved much media publicity through his direct action activities, including disrupting 'dozens of road inquiries in Britain' (Breach 1977i) His campaigning resulted in personal tragedy: he suffered a nervous breakdown and retreated to a monastery. According to his speech at the 1986 ConSoc National Conference his 15 years of impassioned efforts "*have mostly resulted in complete failure, much to his anguish*" (CN 95).
- <sup>43</sup> For details on Energy 2000 including committee minutes and correspondence see Leonard Taitz archives at Sheffield Archives (ref 1993/108 Box 4).
- <sup>44</sup> Transport 2000 was formed in 1973 at the initiative of the National Union of Railwaymen (NUR) as a federation of groups, including environmental ones, in favour of developing the railways. The NUR provided the secretariat and much of the finance for Transport 2000 (see Kimber et al 1974 for discussion of its activities).
- <sup>45</sup> See Boyle 1983: 16 for photo of front page of the Daily Mirror on Tuesday 21st October 1975 - the text is legible.
- <sup>46</sup> There is a great deal published on the Windscale Inquiry; it was covered in detail by the press, mainly by Ian Breach for New Scientist (1977 a- l; 1978; 1978a). Also books by The Guardian (1978); and Wynne (1982).
- <sup>47</sup> Speakers included the MPs Geoffrey Podsworth and Millie Miller, John Donoghue the safety assessment manager from BNFL, Len Brookes, economic adviser for AEA, and Peter Adams, local trade union official (NS 1976b).
- <sup>48</sup> See also coverage in Peace News Nos. 2019-2020, April 1976.
- <sup>49</sup> For Patterson's views on the National Energy Conference see Patterson 1985: 55, 114.
- <sup>50</sup> Sir Kelvin Spencer, was a former chief Scientist with the Ministry of Power in the 1950s. According to Patterson (1985: 86) he had become a 'fiercely outspoken opponent of official British nuclear policy' after having been an 'enthusiastic supporter of nuclear power'. He gave evidence for the SEI at the Windscale Inquiry (Breach 1977i).
- <sup>51</sup> Perhaps echoing remarks made by Walter Marshall in a speech reported in New Scientist (8 July 1976: 85), where he asked "*Everyone is always talking about the nuclear lobby, but where is it? I have never seen the slightest sign of it*".
- <sup>52</sup> Other groups spent significant sums on the Inquiry NNC spent £8,000, TCPA £7,000 just in the first 4 weeks of the Inquiry. Other groups were left with large debts which active members had to pay off, such as PERG (Wynne 1982: 102).
- <sup>53</sup> According to Wynne (1982: 102), James Goldsmith was persuaded by his brother Edward and Gerry Levine - who was James Goldsmith solicitor and influenced by George Dobry QC, a leading member of the Lawyers Ecology Group and counsel for the Isle of Man at the Inquiry.
- <sup>54</sup> The evidence on Euratom, and European nuclear policies was presented by Irene Coates; after a wait of 14 weeks to give it she was told by Justice Parker that her evidence was redundant (Breach 1977i).
- <sup>55</sup> Charles Wakstein had published an article critical of Windscale's safety procedures in the Whitchaven News in December 1975, which was enthusiastically reprinted in Undercurrents No. 16 (Wakstein 1976), with a further supportive article for his views in No. 18 by Martyn Partridge (1976).
- <sup>56</sup> For extensive papers on this legal dispute and the internal conflict in ConSoc see Sheffield Archives 1993/108 Box 1 and 3, Folders Windscale Appeal and Windscale Inquiry Nov78/79.
- <sup>57</sup> According to Wynne "*Cynics also noted that the unusual procedure adopted to allow a parliamentary debate conveniently prohibited review of the government's decision in the courts*" (1978: 351).
- <sup>58</sup> This criticism was published later as a book: Walt Patterson & Czech Conroy 1978. *The Parker Inquiry*. London: FoE.
- <sup>59</sup> The assessors were Sir Frederick Warner and Sir Edward Pochin. On the assessors impartiality see Wynne who comments "*Neither figure appeared to be without an interest*" (Wynne 1982: 87).
- <sup>60</sup> Criticism of the Parker Report has been well covered elsewhere, particularly in Wynne 1982. For the views of participants see the views of FoE in Patterson & Conroy (1978), of the Ecologist in Goldsmith et al (1978), of TCPA in Stott & Taylor (1980), of the UKAEA in Wyatt (1980), and of eight opposition witnesses in Vole (1978). For more neutral views see Pearce (1979), Taylor (1979) and Williams (1980: 301-307), and press comment at the time (a list in Williams 1980: 310 notes 81 & 87).



- <sup>61</sup> The report on the Windscale Assessment and Review Project (WARP) was published in 1979 as Pearce et al 1979.
- <sup>62</sup> The UK Department of the Environment was founded in 1970, the magazines *Your Environment* in 1969, and *The Ecologist* in 1970.
- <sup>63</sup> The 'environmental justice' movement which originated in the USA in the late 1980s argues that living in a poor quality environment (often next to hazardous waste dumps) is not a matter of choice but of power interests (Gottlieb 1993: 235-269; Roberts & Toffolon-Weiss 2001).
- <sup>64</sup> For details of 19th century societies founded to protect wildlife see Holdgate 1999: 6-9; Sheail 1976; Fitter & Scott 1978.
- <sup>65</sup> This split in sex roles continued into the 1980s, with a 1987 internal report for FoE commenting that there was a clear split in the organization between campaigners who were all men and support staff who were virtually all women (Weston 1989: 184).
- <sup>66</sup> Perhaps the first book written by a women activist was *Ground for Concern: Australia's Uranium and Human Survival*, by Mary Elliott, a longstanding anti-nuclear Australian activist, in 1977.
- <sup>67</sup> In 1980 the National Trust had a million members and the RSPB 300,000 (Lowe & Goyder 1983:182).
- <sup>68</sup> Graham Searle of FoE edited the book *Concorde: the Case Against Supersonic Transport* (1971) written by Richard Wiggs, and the organization is listed in the paperback, *The Environmental Handbook* produced by FoE. For FoE's role in this campaign see Lamb 1996: 5-56.
- <sup>69</sup> The numbers are based on my estimates of members per society, based on extrapolation of their 1955 and 1975 figures, giving 150 in 1960 and 200 in 1969.
- <sup>70</sup> Due to pressures of space a chapter on the role of the 1960s counterculture and its alternative press in promoting environmental issues had to be omitted from this thesis. Hopefully it will appear in a forthcoming (1994) paper.
- <sup>71</sup> Very little has been written about the Dwarfs; they are not mention by Allaby in his book on *The Eco-Activists* (1971), although they are mentioned in Shipley (1976: 204). They had an extensive network of branches, their own magazine *Dwarf News* and were active in 1971 in protesting about air pollution (see the underground magazines *Ink* No. 12 and *Friendz* No. 13). They adopted a form of 'anarchist ecology', modeled on previous groups like the Dutch Provos, and were well known to hippies for their festivals and concerts. However a contemporary and similar group, the Diggers, is better known though it received less coverage in the alternative press, mainly because of the antics of Sid Rawle, its self-appointed leader.
- <sup>72</sup> One specific reason given (by Robert Lamb) for David Brower's resignation from the Sierra Club was the Board's refusal to oppose the Diablo Canyon nuclear power plant. Brower had initially supported nuclear power as an 'smart alternative' to hydro-power dams but by the late 1960s was opposing them on grounds of safety and economics (Lamb 1996:34). See also note 99.
- <sup>73</sup> Richard Sandbrook was former student union president at the University of East Anglia, and an environmental activist within the NUS. He became the director of the IIED.
- <sup>74</sup> It was also at Dungeness nuclear power station where Earth First! held their first public action in the UK in 1991, when about 60 people from a variety of peace and anti-nuclear groups such as the Brighton Peace Centre, Sea Action, and Dungeness Action Society of Hastings blockaded the plant (Wall 1999: 46). According to *Green Anarchist* in 1991 the Dungeness area contained "the best example of a cusplate foreland in the world... home to over 600 species of flora and fauna, some of which are rare" (GA 1991). An exactly similar point had been made by protesters at the Public Inquiry in 1958 (see section 7.2.4). Protest it seems is rarely novel, arguments and methods are handed down from one generation of activist to another. The results of protest, generally failure, are unfortunately depressingly similar.
- <sup>75</sup> A UK Government Minister, Lady Hollis, reported that 50,000 people have died in the UK from asbestos-related diseases in the 30 years between 1968 and 1998 (Hollis 2002). The dangers from asbestos have been well known since the first century BC, and asbestosis has been a recognized industrial disease since the 1920s (Gottlieb 1993: 275-7). The much higher number of deaths through mining accidents and industrial disease in use of coal versus nuclear power was a point emphasized by nuclear supporters, like Beckmann (1976: 81-87) and Fremlin (1987).
- <sup>76</sup> According to Morgan (1980: 29) the first to use the term 'atomic bomb' (to refer to the ultimate in destructive power) was Robert Cromie in his novel *The Crack of Doom* (1895), in which a mad scientist realizes that one grain of matter, if 'etherized', contains vast amounts of energy and plans to blow up the world.
- <sup>77</sup> Other prophecies of atomic bomb occur in Harold Nicolson *Public Faces* (1932) and Neil Bell's *The Lord of Life* (1933), both containing warning against uncontrolled scientific experimentation and the dangers in the creation and testing of an atomic bomb. (Morgan 1980: 95).
- <sup>78</sup> Thomas Sturgeon was later to write deeply pessimistic SF novels, *Memorial* (1946) and *Thunder and Roses* (1947), on the dangers and perhaps inevitability of nuclear holocaust (Boyer 1985: 258).
- <sup>79</sup> Ritchie Calder, was a journalist, author and academic, later to become Lord Peter Ritchie-Calder. In the 1950s he was Science Editor, of the London *News Chronicle*, then became in the 1960s Professor of International Relations at Edinburgh University. His fame and interest in food and population issues lead him to be chosen as the President of the Conservation Society, where he gave the 1968 Presidential Address entitled 'Hell on Earth'.



- <sup>80</sup> The significance of milk and radiation can also be seen in the impact of the Windscale fire in October 1957 (Welsh 2000: 96-120). This received minimal adverse publicity until slightly radioactive milk was collected and dumped in the sea. One of the members of the WHO Study group attributed this media concern to 'breast fed editors' (Calder 1962: 25).
- <sup>81</sup> See W H Adams remarks in Section 5.2.3. Other instances of childhood experiences are given in my paper *Childhood Experiences as Triggers for the Ecological Impulse*, Paper to the Annual Meeting of the European Association for Environmental History (UK), the Open University, 9 May 2003.
- <sup>82</sup> Written in February 1955 during his visit to Burma (see Wood 1984: 246-248) and published in 1962 by the Gandhian Institute of Studies, Varanasi, India in *Roots of Economic Growth*. Schumacher later used it in his first book, *Small is Beautiful*, and a companion paper 'Non-Violent Economics' was first published in *The Observer*, Weekend Review, on 21 August 1960 (see McRobie 1981: 21).
- <sup>83</sup> This lecture was revised and used as a chapter entitled 'Nuclear Energy - Salvation or Damnation' in his book, *Small is Beautiful* (Schumacher 1973a: 124-135) and was also published by the National Society for Clean Air in 1967.
- <sup>84</sup> Patterson made similar comments in 1973, when he wrote in his Preface to his first book on nuclear power (1973) that "a nuclear reactor is scientifically no more mysterious than a transistor radio" and of the need to dispel "the impression that nuclear reactors can only be understood and discussed by the 'experts'" (Patterson 1973: Preface).
- <sup>85</sup> Sternglass' views achieved worldwide distribution in mid 1969, with a front page story in the London *Observer*, appearances on Canadian TV, and features in broadcasts in Australia and in New Zealand, besides writing pieces for the *New Scientist* (Boffey 1969: 198). Sternglass' views however were not well known amongst British environmentalist until the mid 1970s with the publication of his book *Low level Radiation* (1973) by Earth Island, the FoE publishing arm.
- <sup>86</sup> For an account of this episode see Freeman 1981; Patterson 1976: 148-151; on Sternglass see Boffey 1969; for Gofman's views see Gofman 1979; 1983.
- <sup>87</sup> Quoted in Pringle & Spigelman 1981: 369. For an account of the ECCS debate and hearing see Patterson 1976: 193-198; Berger 1977: 46-48; Ford 1982. Also see series of four articles by Robert Gillette on 'Nuclear Safety' in *Science* in September 1972: Vol. 177: pp771-776; pp867-871; pp970-975; pp1080-82.
- <sup>88</sup> For details of other individuals and groups active in opposing the Vietnam War who turned into anti-nuclear power protestors, see Cohn 1997: 133-135 and 378-9 notes 13-14.
- <sup>89</sup> This tactic of getting usually pro-nuclear newspaper to run critical stories on the bureaucratic shortcomings of nuclear power, was copied by Walt Patterson and Amory Lovins of FoE in Britain in 1973-4. At a time of large media coverage of the 'energy crisis' journalists were hungry for energy stories, particularly of the 'cover-up' type. Walt Patterson - a vocal critic of the AEA - was able to exploit this desire, such as when he leaked the story that the AEA, perhaps out of defensiveness, requested him not to ask questions at their press conference (Patterson 1998).
- <sup>90</sup> This observation is not made cynically but reflects the fact that NGOs rely for their survival on membership fees and donations from the public and thus have to continually find issues that appeal to their constituencies. See Weston (1989: 205-6) on the pressures to run campaigns that are 'winnable' and 'fundable'.
- <sup>91</sup> The result of the conference was the founding of Critical Mass, probably the largest national anti-nuclear group with several hundred local affiliates and an estimated 200,000 supporters (Olson 1975 in Cohn 1997: 134).
- <sup>92</sup> See note 13.
- <sup>93</sup> Reprinted in Hughes 1975: 250 and Winner 1986: 95.
- <sup>94</sup> There is an extensive fiction in the 1930s, in the form of poems, short stories, novels, essays and 'countrymen notes' on the techno-arcadia themes of urban decline, rural regeneration and scientific progress. For a good example see the poem 'Back to the Land' originally published in *The Observer* in 1933, and reprinted in Luckin 1990: 86.
- <sup>95</sup> For an appreciation of the pioneer environmental thinking of Mumford see Guha 1996.
- <sup>96</sup> For other accounts and discussions on the impact of pylons in the inter-war years see Hannah 1979; and Sheail 1991.
- <sup>97</sup> For a discussion of the issues involved see Chapter 5 in Neuzil & Kovarik 1996; see also discussion in Smith 1987, Udall 1988, and Worster 1988.
- <sup>98</sup> For a very detailed history of the opposition to nuclear power in California see Wellock 1998.
- <sup>99</sup> Brower left the Sierra Club in 1969 to set up FoE, but after bitter internal battles with his staff he was forced to leave in 1984, and established the Earth Island Institute (Gottlieb 147-8).
- <sup>100</sup> For details of opposition over the 1948 Snowdonia hydro scheme and the 1952 Rheidol hydro & Festiniog pump storage schemes, see Sheail 1991: 77-82, and 86-88.
- <sup>101</sup> For a discussion of early 20th century attitudes by scientists and the press to radium, see Chapter 2 'Mainstream Media: the Radium Girls' in Neuzil & Kovarik 1996.
- <sup>102</sup> Weinberg said (Quoted in Cohn 1997: 172):



*"It is a Faustian bargain that we strike: In return for this inexhaustible energy source, which we must have if we are to maintain ourselves at anything like our present numbers and our present state of affluence, we must commit ourselves- essentially forever- to exercise the vigilance and discipline necessary to keep our nuclear fires well behaved. As a nuclear technologist who has devoted his career to this quest for an infinite energy source, I believe the bargain is a good one".*

- <sup>103</sup> For other articles of his at the same period see Lilienthal 1947; for his later views on atomic energy see Lilienthal 1963; and for assessment of his role in promoting atomic energy in the 1940s see Boyer 1985.
- <sup>104</sup> The phrase 'too cheap to meter' was the title of a critical book on the US nuclear dream by Steven Cohn (1997) as well as in the title of a report on nuclear mythologies by Makhijani & Saleska (1996).
- <sup>105</sup> Ralph Lapp was a physicist, early critic of nuclear bomb tests and respected writer on nuclear and scientific research issues in the 1950s and 60s, winning praise from Lewis Mumford (1970: 454). However in the 1970s he was, according to Daniel Ford, to earn controversy by his activities as a PR consultant to the nuclear industry. In February 1974 an article on nuclear safety, discussing the Rasmussen report, appeared in The New York Times Magazine, but he identified himself as 'member of the Sierra Club's energy policy committee' (Ford 1982: 158). For an alternative account of his views, which deals with the complexities of dissent over the ICRP radiation standards, see Caufield 1989: 171-3.
- <sup>106</sup> Strauss did his bit by writing articles in popular magazines like The Reader's Digest, see Strauss 1955.
- <sup>107</sup> The development of the fast breeder was the ultimate goal of nuclear scientists. Glenn Seaborg said in 1961 "A 'breeder reactor' is the nuclear Goddess of fertility, so fecund that, while producing power in plenty, it also breeds more fissionable material than it consumes" (Quoted in Calder 1962: 61). Similarly Alvin Weinberg said "Our main belief... is that nuclear energy is barely worth the candle... unless you develop the breeder" (Quoted in Nye 1994: 234).
- <sup>108</sup> James Lane was a researcher at the Oak Ridge National Laboratory and produced highly optimistic forecasts of plant size, installed capacity and costs to the year 2010, which he presented to a symposium organized by the AEC and Oak Ridge in August 1968. For references to his work see Cohn 1997.
- <sup>109</sup> Hinton only speak publicly of his doubts in 1975 in a House of Lord debate, and publish them in 1976 in a New Scientist article - see Hinton 1976.
- <sup>110</sup> One of the most famous Renaissance utopias was *The City of the Sun* by Tommaso Campanella, published in 1623. For a summary see Carey 1999: 60-62.
- <sup>111</sup> Geothermal power is often included amongst renewable sources of energy, though there is debate as to whether it is 'renewable' utilizing as it does heat from the interior of the earth. The fast breeder reactor and fusion energy are also claimed to be 'sustainable' energy as their fuel supply is practically unlimited but all nuclear power is rejected by solar advocates on environmental and ethical grounds.
- <sup>112</sup> For a quotation from Fox on tidal, wave, wind, hydro and geothermal power, and use of solar collectors, see Clarke 1979: 207.
- <sup>113</sup> The report, with a forward by US AEC, was published as a book on 19 March 1953 (Putnam 1953). There was a similar report by Eugene & Charles Scarlott Ayres, in 1952, which covers the debate on atomic v solar energy: see pp. 168-76, 186-218, 279-83. Also out in 1952 was the report *Resources for Freedom* from the President's Material Commission (or Paley Commission) predicting fossil fuel shortages by 1975, and urging greater support for solar energy.
- <sup>114</sup> For details of this post-war debate see Butti and Perlin 1980: 223-6, and Rome 2001: 49-51.
- <sup>115</sup> Steve Baer was well known as a dome builder at Drop City and the author of *Domes Cookbook* (1968). See Rybczynski 1980: 12 for his photo.
- <sup>116</sup> In Britain the main work, in the style of *The Whole Earth Catalog*, is *Radical Technology*, edited by Godfrey Boyle and Peter Harper (1976), two participants in the British AT magazine, Undercurrents.
- <sup>117</sup> See Searle 1972; Gitlin 1987: 422; Cohn 1997: 378 n13.
- <sup>118</sup> See Pocock 1977; Burn 1978, Williams 1980, Patterson 1985, Roberts 1999; Welsh 2000, with the 1977 Windscale Inquiry providing a forum for the full range of arguments (Breach 1978; Guardian 1978).
- <sup>119</sup> For a statement of FoE's position on direct action, see letter by Tom Burke (1978) to Volc, after Volc's editorial in No. 12 highlighting FoE's 'conspicuous lack of enthusiasm' for direct action. For Burke's views on the anti-nuclear movement in 1980, see Grant (1980).
- <sup>120</sup> In February 1967 six out of 23 Committee Members of ConSoc were women - 25% (ConSoc Newsletter No. 2, March 1967); in March 1970 nine out of 35 members of the executive Committee were women - 25%.
- <sup>121</sup> For a more neutral view of the campaign against the Midland I & II nuclear plants by the Saginaw Intervenors, of which Mary Sinclair was part, see the case study in Ebbin & Kasper 1974: 59-89.
- <sup>122</sup> The most famous one being the 1962 utopian novel *Island* by Aldous Huxley.
- <sup>123</sup> This opposition by the CPRW is longstanding: at the Connah's Quay Inquiry in 1971 the CPRW supported the construction of nuclear power stations in industrial areas, rather than in 'unspoilt' rural coastal regions (Rudig 1990: 118).